INCOME & WEALTH

SERIES III

International Association for Research
in Income and Wealth

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PREFACE

THE International Association for Research in Income and Wealth was established in September 1947 in Washington, D.C., for the purpose of bringing active scholars working in the field of national income and social accounting analysis into organized contact with one another. One of the main activities of the Association is the holding of an international conference every two years, at which papers on theoretical and empirical aspects of income and wealth research are presented and discussed. The papers of interest to a wider audience are selected for publication in the *Income and Wealth* series of the Association.

This volume contains papers presented at the meeting of the Association held at Royaumont in 1951. The principal topics discussed at the Royaumont Conference were the analysis of the longer-term trends shown by estimates of national income and wealth, the international comparability of national income measures, the treatment of government activity in the nationalized sector of the economy, income and product in underdeveloped countries, and the appraisal of the sources and methods used in estimating national income and product in various countries. Because of their length and unity, two papers dealing with longer-term trends of income and wealth in the United States, by Professor Simon Kuznets and Dr. Raymond Goldsmith, were issued as a separate volume, *Income and Wealth Series II.*[1] Work on some of the topics discussed at the Royaumont Conference is continuing, and will appear in subsequent volumes of this series.

A complete list of papers presented at the Royaumont Conference appears at the end of this volume.

Another major activity of the Association is the preparation and publication of an international bibliography on income and wealth. Thus far, two volumes have been issued, covering the periods 1937–47 and 1948–49.[2] Subsequent volumes are now in the press and will appear shortly.

Paris, 1953 MILTON GILBERT

[1] Simon Kuznets and Raymond Goldsmith: *Income and Wealth of the United States, Trends and Structure. Income and Wealth Series II.* Published for the International Association for Research in Income and Wealth by Bowes & Bowes Ltd., Cambridge, 1952.

[2] *Bibliography on Income and Wealth, Volume I,* 1937–47., edited by Daniel Creamer. *Volume II,* 1948–49, edited by Phyllis Deane. Published for the International Association for Research in Income and Wealth by Bowes & Bowes Ltd., Cambridge, 1952 and 1953.

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1

STATISTICAL SOURCES AND METHODS IN NATIONAL ACCOUNTS ESTIMATES AND THE PROBLEM OF RELIABILITY

by Milton Gilbert

Director of Statistics and National Accounts, O.E.E.C., Paris

I. INTRODUCTION

As the title of this paper is not self-explanatory, I should say that it is not my intention to describe the methodology used in the preparation of the United States national accounts. That would require more time than can be taken here, and besides the Department of Commerce has just issued a fairly lengthy report concerned with that subject.[1] What I want to do, however, is to give some impetus to the discussion of methodology by treating three questions: (1) the purpose to be served by descriptions of sources and methods, (2) what they can contain to give the users of the data some understanding of the reliability of the estimates, and (3) the elements that have contributed to raising the reliability of estimates in the United States.

In the short time I have been working with the national accounts statistics of more than one country, I have had a decided change of mind about the emphasis that is required to secure greater international comparability of these measures. Perhaps I should say, greater similarity of national income measures, rather than comparability, since I mean only the formal measurement of income and product flows in national currency units, and not comparisons in real terms. Up to now, practically all the effort of those concerned with this problem has been put on questions of concepts, definitions, and forms of presentation. This work is necessary, of course, and I would not want to imply that it has reached the limit of its usefulness.

But I do believe it is necessary that much more attention be given to differences in the estimates of various countries that arise from the use of differing sources and methods of estimation. In the long run, I feel that a careful examination and comparison of sources and methods, and of the reliability of the results they produce, will contribute at least as much to inter-

[1] National Income Supplement – 1951, *Survey of Current Business*, U.S. Department of Commerce.

national comparability and to the improvement of national accounts statistics as the further discussion of theoretical issues. A change of emphasis in this direction would also be of considerable practical assistance to countries with less developed national accounts material.

An international forum, such as is provided by this Association, is almost a requirement for a productive exchange of ideas and experiences on the problems of sources and methods. Within any one country there are generally only a few persons in the government service with sufficient background to participate actively, and most of these are apt to have experience only with the techniques used in their own country. Hence, to broaden the field and to make it possible to discuss the relative usefulness of alternatives, the contributions of persons from different countries are essential.

II. NEED FOR THE STUDY OF METHODOLOGY

It seems to me also that we are reaching the stage where the examination of sources and methods is needed even to increase our knowledge about the conceptual differences which exist among the measures of various countries. We have fairly well catalogued those which appear on the surface of estimates, arising from differences in the formal definitions used. What remains, however, is to understand the conceptual differences which arise because they are implicit in the use of different sources and methods, and which will come into view only as we know more about the methodology employed.

It is interesting to ask why the material issued on methodology has been rather limited. Certainly the greatest single demand heard from users of the statistics is precisely for an explanation of how the estimates were obtained and what degree of reliability they possess. And yet it is quite evident that national income estimators have shied away from meeting these demands.

The primary reason, probably, is that writing about sources and methods is an extremely tedious and time-consuming matter. Nor does it have the same intellectual attraction as the conceptual and theoretical aspects of national accounts - either for the writer or for the reader, whether he admits it or not. Our experience is that we receive almost no comment on

descriptions of methodology, but that a discussion of theoretical issues always arouses a lively interest.

There is, however, another reason behind the limited discussion of sources and methods. This is that any adequate description of national accounts statistics necessarily involves revealing the skeletons in the closet, pointing to the areas where the estimates are weak and where dubious estimating techniques or guesses had to be used to fill the gaps left by inadequate statistical sources. In other words, when the show-down comes, one has to admit the weaknesses of the estimates. I am sure there is a great natural reluctance to do this, particularly after much work and ingenuity has gone into their preparation. One is always hesitant about arming one's potential critics.

I would like to urge very strongly against such self-consciousness, for it seems to me another instance in which the best defence is to attack. It is entirely wrong that national income statisticians should take responsibility for weaknesses in the estimates due to inadequacy of the statistical sources available to work with. They should not assume such responsibility themselves, and should not allow such responsibility to be thrust upon them. It must be understood that all one can do is to make the best use of the sources there are, and perhaps to point out where sources are weak. But it should be made clear that reliability is basically a question of having good sources, and that the real effort required to improve national accounts data must begin with their statistical underpinning.

Another impediment to writing about methodology is that there has not been developed any generally accepted viewpoint or standard for this kind of work, unless it be that of straight description. There is not a common way of tackling the job, or recognized objectives as to what is supposed to be accomplished by methodological reviews.

I may say that some years ago we, in the United States, decided that once and for all we would meet the continuous demand for material of this kind. In an effort to be perfectly frank with the users of the estimates, we began to prepare complete descriptions of all the estimates we make, to show in detail the sources upon which each figure rested, and the methods by which it was derived. We thought even that the reviews should be detailed enough to allow an outsider to reproduce the estimates. Of course, this proved to be impossible,

but nonetheless we did prepare lengthy descriptions for most of the income items and issued them in mimeographed form. They turned out to be not only very long, but rather boring manuscripts. For example, the section describing the estimates of wages ran to 100 single-spaced pages of mimeographed material.

One thing that was proved by this effort was that such a straightforward, detailed description of methodology will have very few readers – even in a statistically minded country like the United States. Another thing we found was that it took so long to prepare the various sections that the first ones finished were out of date before the later ones were completed, and that it would be quite impossible to get all the sections ready to be published at one time in a single volume. I personally came to feel, too, that a detailed description of procedure of this kind was likely to fail to tell you a lot of the things you really wanted to know. This was partly because the trees tended to hide the wood, and partly because it resulted almost inevitably in a certain stiff style of exposition which did not allow the writer much freedom in expressing opinions and judgments.

Our other attempts to meet this demand have been short descriptions of methodology in articles on various components of the national accounts. These were not intended to do much more than indicate the procedure that was followed and the major sources that were used. From the standpoint of readability they have been more successful, but it must be admitted that they could have been of only limited real value to the users of the estimates.

What I believe is needed in these accounts of sources and methods, if they are to be made interesting to ourselves as well as to our readers, is a more analytical and critical approach to the whole matter. Since it is literally impossible to tell all, we have to decide what purposes we intend them to serve, and, therefore, what elements in them have to be given prominence. The purposes will also be a guide to the amount of detail they should contain.

The purposes which seem important to me are the following:

(1) The primary objective should be to indicate the reliability of the estimates. I believe this is the only aspect of methodology which is really interesting to the general users of the data—even

among professional economists. Furthermore, I think it is only by an adequate discussion of sources and methods that the question of reliability can be illuminated. This implies, of course, that the description of methodology should include a description and appraisal of the kinds of sources upon which the estimates rest.

(2) The second purpose should be to reveal the state of statistical sources, and their adequacy for our purposes, to those responsible for their collection and dissemination. It is apparent that the national accounts estimator is in a peculiarly advantageous position to look upon the various bits and pieces of statistical data as part of a system, and to judge their adequacy from that standpoint. Reviews of methodology can be very helpful to those responsible for particular areas of statistical data if they provide this broader perspective.

(3) The third objective, and perhaps the one to emphasize here, is to make possible an exchange of experience among those who have the job of making estimates. Hence, descriptions of methodology should provide a file from which one can find what methods have been useful to estimators, what kinds of sources they have used, and what adjustments they have made because of the inadequacies or biases of various sources. They should note also what kinds of material have been rejected, and why, what kinds of checks have been used to test the results, and in general give a picture of the problem of estimation from the standpoint of the estimator.

The pursuit of these objectives would give much more point to methodological descriptions, and I believe too, make it much more interesting to produce them.

III. ELEMENTS IN THE APPRAISAL OF RELIABILITY

I will turn now to the question of the character of the problem of reliability and what can be said about it. The suggestion that estimators of national income should indicate the degree of reliability of the estimates is continuously being made. The latest I have noticed is in the interesting volume by Professor Morgenstern, *On the Accuracy of Economic Observations*.[1] He criticizes statisticians for largely ignoring this problem, and indeed, goes so far as to say that quantitative estimates of error

[1] Oskar Morgenstern, *On the Accuracy of Economic Observations*, mimeographed version, 31st May 1949.

should be required from all agencies that publish statistics of major importance. This kind of suggestion is very easy to make, but it is quite significant that it is seldom accompanied by much guidance as to how the job might be done, and even this little turns out to be rather suspect. It seems to me, in fact, to be somewhat lacking in real insight into what reasonably can be expected. To require a quantitative measure of accuracy would either drastically reduce the amount of statistics, or produce a lot of *pro forma* margins of error, since in all honesty most agencies would have to say they do not know the answer.

In considering this problem recently in connection with the description of the estimates of the United States, I concluded that the reliability of the data could not usefully be indicated by assigning quantitative measures of the margin of error to the various components and aggregates. The standard error of estimate has a clear mathematical basis in sampling and can be easily interpreted. But when it is applied to national accounts estimates all this simplicity is lost, and I doubt that it can be interpreted at all by users of the data. Reviewing the attempt made by Professor Kuznets[1] to assign margins of error to the various parts of the national income, for example, I was somewhat at a loss myself to know exactly what they meant, and I doubt that they could have provided a very helpful guide to many readers. Of course, they are presented only as informed judgments. It would, however, be more interesting to clarify the basis of the informed judgments and the factors that were taken into account in making them than simply to sum them all up into a series of numerical margins of error.

I would summarize my objections in the following points:

(1) First of all, I think it must be said that we simply do not know the size of the margins of error in the estimates with enough accuracy to quantify our judgments. The reason is that in the complex of factors that might lead to inaccuracy of the statistics, there are no measures of the errors arising out of most of them, and hence no way to assign them weights so as to arrive at a combined margin of error. For any single survey, one can usually measure the probable sampling error but it is in very few cases indeed that the error in the responses from

[1] Simon Kuznets, *National Income and its Composition*, N.B.E.R., New York, 1941, Vol. II, pp. 501–37, for years 1919–35.

other factors can be indicated. With estimates of the components in the national accounts, the case is much worse because they are seldom based on a single survey.

(2) There are very wide differences of opinion among persons familiar with the series as to the possible margins of error, which make it impossible to give a meaningful concensus of opinion in quantitative terms. They are apt to be due as much to the degree of scepticism of the judges as to the possible errors in the series judged.

(3) The margins of error assigned will be very much influenced by the size of the cells chosen and the opportunity given for offsetting errors.

(4) As there are many differences in the accuracy of estimates over time, it is an over-simplification to assign a single margin of error to the series as a whole. This matter is so complex that, if one tried to assign different margins of error over time, one would find the use of informed judgments inadequate to draw the necessary distinctions. Furthermore, one is often more interested in the changes shown by time series than their absolute level.

(5) It is misleading to assign margins of error unless there is an equal probability of over or under-estimate within the range of the percentage that is chosen. I believe, however, that for any given group of sources and complex of procedures there might be a definite bias one way or the other, rather than an equal chance for a plus or a minus error. For the sources and methods used in estimating the United States national income, I would say that the probability is all toward under-estimates, and that there is little likelihood of the major components or the totals being over-estimated.

The reason for this is that the method used is essentially that of adding up various components which depend for their level on the net aggregates reported in benchmark enumerations. Hence, I believe we tend to get into the series as much of any given flow as has been counted. Although allowances may be made for under-coverage in benchmark enumerations, even these allowances depend upon the amount of under-coverage that can be demonstrated by comparison of basic reported sources. Looking at the procedure as a whole, it is hard to see how there could be a significant over-reporting of either income

or product, while it is much more likely that areas of economic activity could be under-reported. All components of the national income and product estimates are not alike in this respect but, the tendency is sufficiently general to make it less than accurate to imply that the estimates are subject to random error. I would be interested in knowing what others think about this matter, particularly those having experience with the value-added method of estimating. It has seemed to me that a procedure starting from gross values of output and working down to net values, might have a greater possibility of over-estimation, other things being equal.

What I think can be done to give users of the data an understanding of the reliability of the estimates is, therefore, only a critical review of what they are and how they were derived. In the end, this will amount to an impression of whether the various components have a more or less solid basis in statistical fact, distinguishing the areas of the economy and the income and product flows about which there is relatively good knowledge, from those for which our information is rather sketchy. This kind of review is difficult to do, and it is probably only through repeated efforts that a good standard can be reached. In this respect it is much like the process of estimating itself.

The following aspects of the estimates would have to be highlighted to indicate their relative reliability.

1. Differences in the components of national income and product from the standpoint of conceptual clarity.

2. Quality of the records kept by the economic units from whom the basic data are collected.

3. The kind of reporting system by which the basic source data are collected.

4. The estimating process that is required to pass from the data in the basic sources to the final estimates.

5. The change over time in the source data upon which any estimated series rests.

A few comments may be made on each of these points.

By the first, I mean the difference in accuracy that attaches to items that are represented by easily defined transactions as against those which only emerge from a complicated and more loosely defined accounting process. The difference between

wages and profits from this standpoint, for example, or between sales and inventories is what needs to be clarified. There is also the greater chance of error in an item like the change in inventories because small errors in the measurement of stocks at the beginning or the end of the period can produce large errors in the measurement of the change. Of course, if uniform accounting rules were used by all economic units and there was a collection system that assured that all decisions made in the computation of income were reflected in the computation of consumption and investment, we would at least avoid inconsistencies that are now likely to arise because these measures are made more or less independently. But theoretical problems about such components as depreciation, net capital formation, profits, and inventory change would remain. And there would be more scope for difference in applying the rules than in the case of more easily defined transactions. Since there is considerable lack of uniformity in accounting conventions used for such items, however, the possibilities of deviations from the desired concepts are much larger. The difference between measures in current and constant values is also one which depends partly on the inherent nature of the concepts, and particularly needs emphasis. In this case the difference in possible inaccuracy between the series is certainly one of kind as much as one of amount.

The quality of record keeping in the sectors of the economy and the care exercised in reporting systems are, of course, fundamental in judging the accuracy of results. We have tried to bring out such things as whether the data were obtained from units which keep accurate or scanty records, whether uniformity in the accounting system was likely (or in some cases imposed), the difference between censuses and samples, the size and quality of sampling, whether the returns are policed, whether the character of the reporting is likely to lead to biases and, if so, what has been done to correct them.

In order to give the reader a more concrete impression of the influence of strong and weak sources and methods in the major components of the national accounts, we tried to construct special tables showing the proportions of the particular component by their source. In the case of wages and salaries, for example, a table shows that 80 per cent of the total is based on social security records and 15 per cent additional on records of government payrolls. A further table shows that over 98 per

cent of the estimate based on social security records is reported data while only about 1.5 per cent has to be estimated. As both the social security and government sources are described as excellent, the reader is easily able to see our judgment of the entire wages figure. Similarly, in the case of consumers' services (apart from rent) the table of the classification of the estimates by sources shows that almost four-fifths of the benchmark estimates are derived from censuses or similar comprehensive enumerations, while a surprisingly small portion depends upon miscellaneous unreliable sources and guesses. From the text the reader will see that the greater weakness of the estimates is in the scanty data available for extrapolations rather than in the benchmarks.

The importance of the quality of the source is so great that almost always when there are two ways of measuring a given item, one will clearly be more preferable than another. In his monograph on *The Role of Measurement in Economics*,[1] Mr. Stone suggests that it is desirable to have reports from those on both sides of the various transactions so that results can be checked. In practice, however, I believe they rarely provide a check, but that one will be clearly preferable. For example, much more accurate data on wages can be obtained from employers than from employees, and more accurate data on taxes from the government than from the taxpayer.

There is an interesting instance from our work on consumers' expenditures for commodities which reflects the differences in reliability arising from both these aspects of statistical data. We have been able to build up these estimates from three sources; consumers' budget data, the census of distribution, and the censuses of production. Thus, the first derives from sampling of economic units that as a rule do not keep records; the second from the stage in economic process where there are many small units to be covered by the census with records of not too high equality; the third from the sector of the economy where there are the best records and where the large units account for the major portion of output. Despite the fact that the third method involves the most complicated statistical procedure – distinguishing between intermediate and final products, adding distribution margins and transportation, adjusting for changes in inventories and for imports and exports – it has thus far given the most

[1] Richard Stone, *The Role of Measurement in Economics*, Cambridge, 1951.

reliable results. Budget studies are clearly the least satisfactory from the standpoint of over-all accuracy. But it may be that in time the distribution census will prove a more reliable basis for the estimates as its coverage is improved and as distributors' records are improved.

The need to describe the estimating process need hardly be stressed. Apart from the adjustments that are made to source data to correct for coverage and biases, there are often serious differences between what is measured by the source data and the item required in the national accounts. And, unfortunately, the data available for making such adjustments are usually less adequate. Hence, although the purpose of the estimating process is to make the data more accurate by the standard of the definitions used in national accounts, too often it adds an unknown element of unreliability to that of the basic original sources. The best that can be done to clarify the matter for the users of the data is to make all the assumptions used in the estimating process as explicit as possible.

It goes without saying that the estimates could be immensely improved if the source data were better adapted to their needs. However, I do not believe that the use of roundabout methods of estimating could be largely eliminated, as has been suggested, by changing to a system of sampling of the precise items required. Data collected for other purposes, such as administrative statistics, will in some cases always have certain advantages arising from the quality of records kept and the greater reliability of the reporting system.

The changes in the sources underlying any given estimate over time is an aspect of reliability that is little understood. It is because of this that there is continuous complaint about revisions of estimates – and usually from those who raise questions about accuracy. It should be rather clear that with all the data existing at any one time, the estimates which are based on benchmark enumerations will be the most reliable, while extrapolations to more current periods that are based on less complete data will be less reliable. On the other hand, as one goes back over time, the data available for making either benchmark estimates or extrapolations was much more limited. Therefore, before the most recent benchmark year for any given series, the estimates are likely to be less reliable than the estimates for more recent periods. In addition to increasing the accuracy of the

major aggregates, however, the important result of improving statistical sources has been to allow you to do things that could not be done in earlier periods, either in providing more detail in the estimates or in providing them more currently.

Because of a failure to recognize the changes in sources available at different times, some of the observations on the reliability of national income statistics made by Morgenstern[1] are rather pointless. For example, he compares Kuznets'[2] estimates for the period 1929–38 with those of the Department of Commerce (as shown by Marvin Hoffenberg in 1943[3]), saying that they have both drawn on the same fundamental information and that the differences, apart from conceptual differences, are the result of using different methods. The differences were very small in the earlier years but were 2 per cent in 1936 and 1938 and 3.2 per cent in 1937.

Although Morgenstern considers this a high degree of agreement, I would consider the differences quite large for an aggregate like national income where there is lots of scope for offsets among the series, if the estimates were in fact based on the same information; particularly as Kuznets' work was made fully available to the Commerce Department staff. However, the fact is that Kuznets' estimates were made before the 1939 censuses were available – population, manufactures, mining, business, and agriculture – whereas the Commerce estimates were made afterwards. Hence, the later years of his series were extrapolations based on limited data, while the Commerce series were interpolations between firm benchmarks.

Much the same applies to the comparison he uses of the Commerce Department series before and after the revision issued in the *National Income Supplement* of July 1947. The statistical revision for the period 1929–40 averaged less than $0.4 billion per year and the largest was only $0.8 billion. This means no more than that there was little new information available when the revisions were made that was applicable to years so far removed. For the later years, however, the source data were constantly growing and the revisions were accordingly somewhat larger. This still does not tell us much about relative

[1] Morgenstern, *op. cit.* pp. 112–16.
[2] Simon Kuznets, *National Income and its Composition*, *op. cit.*
[3] Marvin Hoffenberg, Estimates of National Output. Distributed Income, Consumer Spending, and Capital Formation, *Review of Economic Statistics*, Vol. XXV, p. 158, May 1943.

accuracy. So far as the 1940's are concerned, in fact, we will not have reasonably definitive revisions until the results of the recent censuses are available and incorporated into the estimates, as no censuses were taken from 1939 to 1947.

IV. IMPROVEMENT OF ACCURACY

As mentioned above, one of the purposes of exposing the weaker areas in national accounts estimates is to stimulate efforts to improve their reliability. To this end it is helpful to review the elements that have contributed to past progress. Although I can speak only of the experience we have had in the United States, I believe some aspects of this experience have more general applicability.

I have suggested already that national accounts estimates can be made at the present time with greater reliability than was the case, say, ten years ago. This may not be so for all the minor components in the whole complex of the national accounts, but it is true generally both for benchmark and for current estimates. The elements which have contributed to this improvement may be grouped into five categories.

1. *Work of Division of Statistical Standards*

I put this first since its influence has been exercised over the entire field of statistics and not confined to particular areas. The Division, which is in the Bureau of the Budget, has a general supervisory function over statistics in the Federal Government, with respect to both standards of statistical practice and the planning of the Federal statistical programme. While it is required to see that duplication of effort among agencies is avoided, its viewpoint need not be negative, because its programming function requires it to give weight to the needs of consumers of statistics. As the Division is in a position to influence the decisions about budgets, its views are of obvious importance to the statistical agencies· and since it is not itself a statistical collection agency, it is in a good position to be impartial.

Without under-emphasizing the initiative of statistical agencies themselves, I do think that an important impetus to the adequacy and reliability of statistics has been obtained by having an agency charged with this responsibility. Observing the work of the statistical agencies as a whole, it is able to see the

lacunae in the data available, as well as to spread the use of better techniques and methods. In a large country like the United States, where many agencies of government must be engaged in statistical work because of the diversity of administrative needs and interests, it is difficult to see how over-all standards with respect to either programme or methods would be achieved unless some agency was given the assignment.

2. *Improvement and extension of administrative statistics*

Better administrative statistics have had more importance in improving national accounts estimates than any other factor – perhaps because they have so many aspects and cover such a wide range of data. While the changes have been made possible in some cases for reasons not connected with statistics, there has been a quite conscious effort to make such data more meaningful both for administrative purposes and as information of general interest. This is reflected in the statistical data the agencies collect as well as in the tabulations they prepare and make available.[1] The following are the more significant developments:

(*a*) Data on wages and employment provided by the social security system. The Social Security Board has made excellent use of the statistical potentialities of the programme and from the beginning recognized the wider uses of the data it could produce. Hence, it has been concerned not only with receipts and outlays under the programme, but with total wages and employment in covered industries, and with such statistical questions as degree of coverage, classification, accuracy of reporting, and prompt issuance of data. The reporting system under the programme is not only comprehensive in its coverage, but its accuracy is high because it has public support, regularity of reporting, standardized accounting, and the reporting on individual employees and their wages is done in a way that assures a minimum of physical errors and omissions.

As the social security records contain a virtually complete list of establishments with one or more employees, they are used by a purely statistical agency like the Census Bureau to assure completeness of its lists of establishments. Such cross-checking also helps produce similarity of classification between the census and social security tabulations.

[1] I believe rather strongly that much more can be gained in improving national income statistics by developing administrative statistics than by creating extensive sampling systems as is advocated by some writers, e.g. J. R. N. Stone, *The Role of Measurement in Economics*, *op. cit.*, pp. 57–60.

(*b*) Income tax data for unincorporated business. The potentiality for improving these data arose from the fact that the increase in the level of income has meant that virtually all firms have had to file returns, thus providing for almost complete coverage of non-farm unincorporated business. To take advantage of this potential source of data, the Bureau of Internal Revenue has adopted a biennial schedule of tabulating the returns. This frequency of tabulation has in itself become feasible because the Bureau is using probability sampling to cope with the huge number of returns. Thus, data are made available now at fairly frequent intervals which extend down through the lower-size classes of firms. Of course, the problem of under-reporting in data from income tax source remains, but even this problem will be reduced as the extensive auditing programme of the Bureau becomes effective.

(*c*) Corporate income tax data. The weakness of these data formerly was an unknown bias from under-reporting. Recently, however, the Bureau of Internal Revenue has made available tabulations of the additional revenues that have been assessed as a result of auditing the income tax returns. The increase in income assessed each year is divided according to the year in which the original tax return was filled, thus allowing a systematic correction of the tabulations from the original returns.

(*d*) Data on government activities. The inadequacies of government accounts from an economic viewpoint is an old problem. While there has not been a fundamental change in the system of accounts, several important improvements may be noted:

(1) To overcome the difficulty of extracting information on payrolls and employment from the regular government accounts, a separate reporting system for these data has been established by the Civil Service Commission. The National Income Division formerly tried to gather this information itself through direct contact with the various agencies, but the results were much less satisfactory than the present system both with regard to timing and accuracy.

(2) A separate reporting system has been established for overseas transactions of government agencies. This information is now regularly and accurately available, whereas formerly the situation was quite chaotic.

(3) Since the passage of the Federal Reports Act (1943) there has been a marked improvement in the reports of Federal Corporations, as data on their activities are now much more complete and more regularly available. This has gone a long way toward removing the mystery which formerly surrounded the activities of these bodies.

(*e*) Building permits data. These data have been the basic source for estimates of residential construction for many years. As they relate to intentions to build, however, they were not too satisfactory a source for estimating construction put in place, as required in the national accounts. The possibilities of measuring construction activity more accurately were studied carefully by an interdepartmental committee. But in the end it was decided that, considering the small-scale character of the industry and its wide dispersion, permits issued by local authorities provided a firmer base from which to begin than any other reporting system that could be devised at reasonably comparable cost. Hence, improvements in the estimates have come through a series of special statistical studies to establish more accurately the relation between permit data and construction activity. I mention this case particularly because it illustrates the thesis that administrative data often provide the most feasible basis for statistical estimates and that improved reliability can be achieved more easily by building on them than by turning to an entirely new reporting system.

(*f*) State sales tax data. As many of the States having sales taxes are tabulating their returns promptly and with an adequate classification system, these data have proved very helpful in extrapolating the benchmark estimates of retail sales and consumers' expenditures.

3. *Improved sampling methods*

Sample data are used extensively in the preparation of the more current national accounts estimates, the benchmark estimates largely being based on comprehensive enumerations. The change in the quality of sample data has been rather remarkable. It has come about not only because of the invention of new sampling techniques and a better knowledge of sampling methods, but through a change in attitude by some of the leading statistical agencies toward sampling. There was formerly a belief that only tabulations of reports received should be

published and that the statistical collection agencies should not make estimates on the basis of the sample data. Unfortunately, this attitude was combined with a lack of interest in the representativeness of the sample information. This attitude has completely changed and a high standard in sampling methods is now the rule. The following sample series which reflect this improvement are the most important from the standpoint of national accounts estimates: retail trade, wholesale trade and inventories, manufacturers' sales and inventories, capital outlays, corporate profits, payrolls and other financial data of State and local governments, gross receipts and incomes from professional practice, and the monthly report on the labour force which periodically includes data on income and rents.

4. *Standardized classification*

Another important factor which has increased reliability, since various sources must be used jointly in the estimating process, is the adoption of the standardized codes of industrial and commodity classification by all the important statistical agencies. The use of the same system by the Census Bureau, the Bureau of Internal Revenue and the Social Security Board has been particularly helpful. A recent substantial revision of the standard industrial classification is at present causing some difficulties in establishing comparability with estimates for previous years, but this problem should be lessened as data on the new basis become available for a longer time period. The major difficulty remaining is that of the incomparability arising between data classified by establishments and data classified by firms, to which no easy solution is possible.

5. *Estimating methods*

Finally, it may be said that reliability has been increased by more precise and more careful preparation of the estimates. In large measure this has occurred just with the passage of time as the various parts of the estimates have been gone over by several research workers. Each time a thorough review of sources and methods has been made by competent personnel there has been an opportunity to add refinements in techniques, to understand the sources better, to check alternative sources, and to make use of additional minor sources.

In addition, however, more specific improvements in estimating methods may be mentioned. One of these has been the

substitution of direct estimates for residuals. Estimates derived as residuals must always be suspect as they can reflect the compounding of errors in the components estimated directly. Since the time that consumers' services and personal saving have been estimated directly, it has not been necessary to rely on residuals for any major component in the United States national accounts. We have retained the residual saving estimates in the accounts largely to avoid the inconvenience of a statistical discrepancy between the debit and credit sides of the personal account. However, the user of the data is told to refer to the direct estimates of saving when dealing particularly with this flow.

Another improvement in methods has been to make the estimates in greater detail by using more detailed classifications of industries, incomes, and products in the estimating process. The classifications we use for estimating purposes are actually much more detailed than those in which the results are published, because it has been found that tests for reasonableness and comparisons of alternative sources can be made more effectively when the cells are as homogeneous as possible. Greater detail also allows one to separate the stronger from the weaker estimates and thus to concentrate efforts to improve the latter.

This result has been promoted also by preparing the estimates in accordance with a well-developed system of national accounts. The help that is gained in securing consistency and avoiding hidden assumption in the estimates by an accounting system has often been stressed. It is, however, also a means toward greater accuracy because in many cases the only feasible check upon the estimates on one side of an account is the compilation of the items on the other side. For this reason, we have prepared accounts for sectors of the economy which we have not made explicit in our published accounting system, such as rental property, owner-occupied houses, and non-profit institutions. The agricultural estimates are also built up in the form of a balanced account. We have not as yet used input-output estimates for this purpose, but it is apparent that the integration of an input-output matrix into the national accounts would help statistical accuracy, and I understand this has been found to be the case in several countries. The extended use of balanced accounts both in the estimating process and in the collection of statistics must play an important part in further improvement of accuracy.

2

LONG-TERM CHANGES IN THE NATIONAL PRODUCT OF JAPAN SINCE 1878[1]

by Shigeto Tsuru and Kazushi Ohkawa

I. INTRODUCTION

JAPAN emerged as a modern state after the Restoration of 1868; and economic historians seem to be in general agreement that the business downturn of 1890 marked the first capitalistic crisis in Japan. The twenty-two years between those two dates are filled with a series of innovations in all aspects of Japanese life. The first mechanized spinning mill started its operation in Kagoshima in 1867; and the construction of the first line of railroad was begun in March 1870 between Tokyo and Yokohama. In the institutional aspect of the society, the feudal clan system was replaced by the prefectural system of administration in 1871. Feudal status was replaced by the more or less formal classification of peers, samurai, and commoners in 1872. Free choice of calling required several steps, but was practically complete by August 1872 when farmers were allowed to engage in commerce. Repeal of the prohibition of the sale of land (1872) and permission to divide any lot for sale or tenancy (1875) completed the recognition of private property in land. Free sale of agricultural products, notably rice, came in 1873, and freedom of abode in 1871, when clans were abolished and cultivators freed from any restriction by lords. Unified convertible currency was established only in 1885; and all the government notes became redeemable in silver at the Bank of Japan (established in 1882) as from January 1886.

Most of the government statistics, which comprise the major part of our statistical data for the Meiji Era (1868–1912), do not begin until 1873. The Report of the Currency Commission, which contains many important series not necessarily connected with the currency problem as such, begins its statistical series in 1873. Banking statistics also are available only from 1873.

[1] The authors are grateful to all the members of the Institute of Economic Research of Hitotsubashi University for their collaboration, in particular to Professors Chotaro Takahashi and Isamu Yamada, and also to Messrs. Mataji Umemura and Tsutomu Noda. Valuable suggestions have been received also from Professor Yuzo Yamada of Hitotsubashi University and Mr. Harry Oshima of the Statistical Office of United Nations.

though Japan certainly had banks before that date. Rice production is reported from 1873, and mineral production from 1874.

Such being the background of the modern economic development of Japan, it is only reasonable to start our statistical inquiry of economic growth from somewhere in the latter part of 1870's. Even then, however, statistical information for these early years is often extremely fragmentary; and it is doubtful if we can use them for any analytical purpose which requires a fair degree of accuracy in figures. Some demographic experts have asserted that even the population figures for Japan are not reliable until after the beginning of the twentieth century. In spite of these reservations, however, an attempt is made in the following pages to estimate major aggregative series for Japan from 1878 and to discuss long-term changes in the national product of the country.

By way of introduction, it may be useful to point to three broad considerations in relation to Japan's modern economic development. They are (a) impact of wars on economic growth, (b) the rôle of foreign capital in Japan's economic development, and (c) a marked upward trend in prices. We shall touch upon them quite briefly in turn.

In the course of half a century Japan was involved in four major wars; the Sino-Japanese War of 1894–95, the Russo-Japanese War of 1904–05, the First World War, and the Second World War which for Japan began in 1931 with the Manchurian expedition. When we examine various economic time series, we find that these wars always marked a major turning-point in the upward rise of economic activities. The fact that wars played a significant rôle in a country's economic development means that those industries which were closely related to war activities received special encouragement from the state, both as regards the provision of capital and technological improvements. At least until 1941, when Japan launched into her grandiose attack against the U.S.A. and U.K., she may be said to have been victorious in every war she fought since the Meiji Restoration of 1868. Victories always brought their economic fruits, and gave further encouragement to those forces and motive-powers which favored war-like activities. Thus it will be difficult to discuss the long-term economic development of Japan without keeping in mind the impact of the successive and successful wars which Japan fought.

The second point is of special importance as an aspect of a more general question of the growth of under-developed countries. One usually expects that a backward country emerges out of its slumber with the aid of foreign capital. Japan, however, is a notable exception. From the time Japan opened her doors to outside world in the 1850's until the end of the Sino-Japanese War in 1895, by which time she was already herself an 'imperialist' power, all the foreign capital she allowed herself to import was the meagre £3.2 million from England in the early 1870's, mainly for the construction of the first railroad between Tokyo and Yokohama. How Japan managed to grow economically at a fairly rapid speed without the aid of foreign capital is a problem which is important in itself and requires a special analysis. Here we can do no more than just refer to it.

The third consideration is the long-term trend in prices. Without counting the latest period of inflation subsequent to defeat in the recent war, we find that the general price level of Japan rose by about 400 percent in the course of seventy years up to 1940. Such an upward trend, when compared with the American experience of less than 100 percent rise during the same period, gains special significance. A mild degree of continuous price inflation is always favorable to business activities; and it results in some measure of forced saving. The fact that Japan seems to have had a fairly high rate of saving throughout the period of her modern development may be partly accounted for by an element of forced saving incident to continuous price inflation.

II. NATIONAL INCOME STATISTICS OF JAPAN

The first attempt to make a statistical estimate of Japan's national income was done by Kinzo Nakamura for the year 1900.[1] His method was to add estimated value-added figures by industries; and although the method is anything but exact, the result he obtained does not seem to be far from the truth. Other scattered attempts at estimating Japanese national income in the early years are as follows:

(1) Tetsutaro Yamashita's estimate for 1904, based upon estimated consumption statistics.[2]

[1] Kinzo Nakamura, *Teikoku Jinmin no Shotoku* (Tokei Shushi, No. 255), October 1902.

[2] Tetsutaro Yamashita, Waga kokufu-ryoku no chosa, *Toyo Keizai Shimpo*, Nos. 378 and 379, June 1906.

(2) C. V. Sale's estimate for 1907, mainly based upon income statistics.[1]

(3) J. Stamp's estimate for 1914: an attempt to improve upon Sale's estimate.[2]

It was not until 1925 that the Japanese Government took the initiative in making a systematic attempt at estimating the national income of the country. Utilizing the income tax statistics, the Cabinet Bureau of Statistics made a fairly detailed estimate for the year 1925, and at the same time carried the estimate back to 1887 by utilizing an index based upon the changes in the so-called 'Class C Taxable Income'.[3] It is extremely questionable if the index referred to was the proper one to use even for the purpose of obtaining a rough measure of the national income for earlier years. Now we know, on the basis of other figures, that the results obtained by the Cabinet Bureau of Statistics for earlier years were gross underestimates, and that we have to revise them completely. The second attempt by the Cabinet Bureau of Statistics was for the year 1930. This time a new method was employed in that the 'national income produced' approach was taken for agriculture, fisheries, mining, manufacturing and commerce and the 'income distributed' approach was taken for other sectors of the economy.[4] As far as it went, the resulting figure for 1930, we may say, was the first conscientious product in Japan in the field of national income estimation. The Cabinet Bureau of Statistics again used the same index as before (the index of 'Class C Taxable Income') in order to estimate the national income for the years 1926–29. They repeated a similar detailed estimate again for the year 1935; but unfortunately the work-sheets were destroyed by fire before the final compilation was ready for publication.[5] This turned out to be the last full-scale attempt by the Cabinet Bureau of Statistics to estimate the national income. After the war, the work was shifted within the government first to the Ministry of Finance and then to the Economic Stabilization Board.

[1] C. V. Sale, Statistics of Japan, *Journal of Royal Statistical Society*, 1911.
[2] J. Stamp, Wealth and Income of Chief Powers, *Journal of Royal Statistical Society*, 1919.
[3] Naikaku Tokei-kyoku, *Taisho* 14-*nen ni okeru Kokumin Shotoku*, 1928.
[4] Naikaku Tokei-kyoku, *Showa* 5-*nen Kokumin Shotoku Chosa Hokoku*, 1933.
[5] Some of the results of this estimate were mimeographed, however, as Soricho Tokei-kyoku, *Showa* 10-*nen Kokumin Shotoku Suikeiho*, 1948.

The most serious attempt by a Japanese economist to estimate Japan's national income before the war was by Professor Seibi Hijikata.[1] The main body of his estimates covers the period 1919–30; and the method he employed was

(1) to use production statistics for agriculture and fisheries, and

(2) to estimate income payment by categories (such as, wages, profit, etc.) for each industry, so far as other industries are concerned.

He also extended his estimate backwards to 1900 on the basis of the estimated changes in profit-rates in agriculture, manufacturing and commerce. And later he brought his series up to date as far as the year 1937.[2] One should also mention here another independent estimate of Japan's national income by the Japan Economic Federation for the years from 1931 to 1939.[3] Here, both the production and the income statistics were utilized in estimating national income produced by industries; and the results obtained are generally higher than those by the Cabinet Bureau of Statistics for the period covered.

The foregoing description is certainly not exhaustive. There are, for example, independent estimates by Mr. Colin Clark for the years 1887, 1897, 1908 and 1914,[4] and also some scattered estimates by Kei Shibata,[5] Kamekichi Takahashi,[6] and the *Oriental Economist*.[7] But these cannot be said to be first-hand full-scale work in the field. More recently, Professor Yuzo Yamada, after surveying carefully all the past estimates of Japan's national income, made his own adjustments on the basis of the known figures and arrived at a new series which turned out to be higher than any of the past estimates for every year.[8] The procedure we have taken in the present work is to use Professor Yamada's figures as our starting-point and to improve upon them wherever we found necessary and possible.

[1] Seibi Hijikata, *Kokumin Shotoku no Kosei*, 1933.
[2] Seibi Hijikata, Waga kuni saikin no kokumin shotoku, *Keizaigaku Ronshu*, July 1938.
[3] Japan Economic Federation, *National Income of Japan*, 1930–1939, 1939.
[4] Colin Clark, *The Conditions of Economic Progress*, 1940, p. 116.
[5] Kei Shibata, Nippon no keizai-ryoku, *Keizai Ronso*, May 1939.
[6] K. Takahashi, *Senso to Nihon Keizai-ryoku*, 1937.
[7] *Oriental Economist*, June 1939.
[8] Yuzo Yamada, *Nihon Kokumin Shotoku Suikei Shiryo*, Toyo Keizai Shimpo Sha, 1951.

III. NATIONAL INCOME PRODUCED, 1878–1942

Table I gives the quinquennial averages of *national income produced in current yen* as divided into primary, secondary, and tertiary industries from 1878 to 1942.

TABLE I

National Income Produced

(Current million yen)

	Primary		Secondary		Tertiary		Total
	M. yen	Percent	M. yen	Percent	M. yen	Percent	
1878–82	414	60.7	70	10.3	198	29.0	682
1883–87	326	53.3	87	14.2	199	32.5	612
1888–92	445	47.0	129	13.6	372	39.4	946
1893–97	601	46.4	223	17.2	472	36.4	1,296
1898–02	927	44.5	421	20.2	733	35.3	2,081
1903–07	1,136	40.5	514	18.4	1,152	41.1	2,802
1908–12	1,405	39.6	713	20.1	1,428	40.3	3,546
1913–17	1,634	34.6	1,218	25.8	1,873	39.6	4,725
1918–22	3,670	32.7	2,890	25.8	4,648	41.5	11,208
1923–27	3,194	26.3	3,124	25.7	5,324	48.0	12,142
1928–32	2,271	19.7	3,282	28.5	5,978	51.8	11,531
1933–37	2,829	18.3	5,091	33.0	7,523	48.7	15,443
1938–42	5,229	16.3	13,241	41.4	13,564	42.3	32,034

Income produced in primary and secondary sectors has been estimated independently all the way through; and for most of the earlier years income produced in the tertiary sector has been estimated as a residual from the total national income for which an entirely independent estimate was made. However, keeping in mind this limitation in method, we may compare the relative importance of each sector in the total and note how it changed over time. It can be seen from Table I that while the percentage occupied by secondary industries increased steadily from about 10 percent to about 20 percent toward the turn of the century and then to about 40 percent in the late 1930's, the proportion for primary industries showed a gradual decline from more than one-half to about one-sixth during the course of years under survey. As for tertiary industries, the general trend shown is upward, that is to say, roughly from 30 percent to almost one-half. Here, however, the peak was reached in 1932 (57 percent) and thereafter shows a rapid decline. In terms of annual figures,

the secondary sector passes the primary in 1926 and the tertiary in 1941.

Technical notes

We must concede, to begin with, a fairly large margin of error in the series presented here. Especially for the years before 1919, our estimates had to be indirect ones owing to the non-existence of those basic data which are essential to the estimation of aggregative series. Thus it is quite likely that whatever improvement that can be made in the future will be not of the kind benefiting from the discovery of reliable and relevant data but of the kind resulting from greater ingenuity in the use of indirect methods. Although the figures presented in Table I are constructed out of annual figures, the latter in themselves are so far from reliable that the best we can do at present is to speak in terms of the broad historical trend as revealed in the series of quinquennial averages.

In general terms, national income produced in primary and secondary sectors is estimated here by applying a 'net income ratio' to gross value produced. As for the income produced in the tertiary sector, we finally adopted an eclectic method. At first we tried to derive it by applying to the 1930 census estimate of income per head of the gainfully occupied population in the tertiary industries, the arithmetical average of the wholesale price index and nominal wage index; this gave us the income per head of the gainfully occupied population in other years and we multiplied this by the number of gainfully occupied population in each year. But the result obtained did not appear satisfactory when checked against some of the isolated figures which are known. Therefore we then decided to make use of the estimates by other economists for the period after 1918 and to modify them to a certain extent, and as for the earlier years we estimated the total national income indirectly from the Pareto coefficient and then subtracted the income produced of primary and secondary sectors deriving the figure for the tertiary sector as a residual. We readily admit that here our estimate is of extremely tentative character. Following are detailed explanations of the method we employed in deriving the figures of Table I.

Classification

'Primary industries' include agriculture, livestock and dairy

industries, forestry and fisheries. 'Secondary industries' include mining, manufacturing, and public utilities. 'Tertiary industries' refer to all others, including construction, transportation, communications, commerce, government, etc. We are aware that it is not customary to include 'construction' in the tertiary sector as we do here. But for the moment it was not possible to separate it and reclassify it all the way through.

1. *PRIMARY INDUSTRIES*

In general, our method is to obtain quantity series wherever we can, such as the quantity of rice produced, and then with the appropriate price figures we derive pq series. As for the commodities for which the quantity figure is not known annually, we estimate the proportion with which the unknown pq is related to the known pq from a specific survey of a special year, and make use of such a proportion in deriving the pq series all the way through. After $\Sigma p_i q_i$ is known, we apply an appropriate 'net income ratio' to arrive at the figure of income produced. So far as the cereal products are concerned, we checked the estimated supply figures (production plus import minus export) against the consumption habit of Japanese which we may assume to be fairly constant over the past seventy years. The result is not very satisfactory. It is almost certain that the recorded production figures were too low in the nineteenth century probably by as much as 20 percent. But we have left the pq series for cereals uncorrected in this study inasmuch as the correcting operation appeared to be too hazardous at this juncture.

(*a*) *Gross Value Produced*

Agriculture

(i) 1878–1899: The sector is composed of six categories, namely, rice, other cereals, pulse, agricultural raw materials (such as raw cotton, tobacco, rape-seed, etc.), other agricultural products, and cocoons. The pq series for cocoons can be estimated separately for each year on the basis of the quantity produced and the price derived from the recorded export price of cocoons.[1] As for the rest, we are given the pq series for rice

[1] Since it is extremely cumbersome to enumerate sources for all the figures we used, we are omitting the detailed footnotes in this report. If any of the readers is interested in consulting the original source for any of the figures we mention here, he may write to the authors, care of Hitotsubashi University, Kunitachi, Tokyo, Japan, for further information. We shall be glad to supply him with the information asked for.

and other cereals between 1889 and 1899. Since these two categories together occupied in 1888 (according to our estimate) 73 per cent of the agricultural products other than cocoons and since the percentage increased to 75 in the period 1922–26, we assumed a straight line trend in this percentage in the intervening years and estimated the total of 'agricultural products other than cocoons' on the basis of the pq series of rice and other cereals. For the period 1878–1888 the only complete pq series we had are for rice, barley and wheat. However, there exist two valuable documents for this period which gave us some clues to the proportions which various products occupied in the total, namely, *Kogyo Iken* (Recommendations for the Promotion of Industries) which supplied us with the figures for 1878, 1880 and 1882, and *Noji Chosa-hyo* (Research on Agricultural Matters) which made a detailed study of the agricultural conditions in 1888. With the aid of these two documents we derived various proportion factors between a part and a whole. For example, the proportion factor for wheat and barley to the total of 'other cereals' turned out to be 63 per cent for the period 1878–82 and 65 per cent for the period 1883–87. That for soya bean to 'pulse' was 80 per cent for the period 1878–88. And so on. In this way the total of 'agricultural products other than cocoons' was estimated for the earliest decade under survey.

(ii) 1900–1919: For this period we reclassify agricultural products from the standpoint of convenience in estimating the pq series by groups. The new grouping is as follows:

A. Rice.
B. Wheat and Barley.
C. Cereals other than rice, wheat or barley; Pulse; Potatoes.
D. Agricultural raw materials.
E. Tea and Cocoons.
F. Other agricultural products (vegetables, fruits, etc.).

The pq series for groups A, B, and E are taken from Professor Yuzo Yamada's work cited earlier. Group C is estimated to have a proportion factor of 20 per cent relative to rice on the basis of *Kogyo Iken*, *Noji Chosa-hyo*, and official statistics of the Ministry of Agriculture and Commerce. The proportion factor for group D relative to rice is assumed to have declined from 10 per cent in 1900–06 to 7.6 per cent in 1907–14 on the basis

of the same source as above. For the years 1915 to 1919 we can calculate a specific factor for each year. Group F is estimated to have the proportion factor of 13 per cent relative to the total of groups A to E. The basis is the actual ratio obtained from the figures of 1920, 1924, 1927, 1931 and 1935.

(iii) 1920–1942: For this period, Professor Yuzo Yamada's figures are taken with only minor modifications.

Forestry

(i) 1878–1899: Gross value produced in the forestry sector is assumed to have the proportion factor of 10 per cent relative to that in agriculture on the basis of empirical data for later years for which we have more complete information.

(ii) 1899–1914: Forestry products can be broadly divided into two groups; namely, timber on the one hand, and charcoal, firewood, etc., on the other. For this period we have statistics only for the former. Therefore we have estimated the proportion factor of the latter relative to the former as being 50 per cent on the basis of empirical data for later years. Such a percentage comes out to be 57.4 as an average of five years, 1915, 1918, 1921, 1922 and 1923.

(iii) 1915–1923: There are two gaps in the empirical data for this period, namely, 1916–17 and 1919–20. For these years we estimate, therefore, the proportion factor referred to above by taking the arithmetical mean of two known factors, one for the preceding year and the other for the following year of the period for which we have no information. For example, the proportion factor for 1916 and 1917 is estimated to be 54 per cent derived as an arithmetical mean of 52 for 1915 and 56 for 1918, both of which are empirical figures.

(iv) 1924–1942: Professor Yuzo Yamada's figures are taken without any modification.

Livestock and dairy industries

(i) 1878–1899: According to *Noji Chosa-hyo* this sector is found to have the proportion factor of 2.7 per cent relative to gross value produced in agriculture. On the assumption that there was more under-reporting for this sector than for agriculture in *Noji Chosa-hyo*, we have arbitrarily raised the factor to 3 per cent and applied it to all the years in this period.

(ii) 1900–1942: Professor Yuzo Yamada's figures are taken without modification, although there are some grounds for believing that these figures are too low.

Fisheries

(i) 1878–1888: We first calculated empirically the proportion factor for this sector relative to gross value produced in agriculture for the period 1889–99, drew a straight line trend through these figures, and then extrapolated this trend backwards to 1878. This method gives us the factor value of 7.3 per cent for 1878 and 8.5 per cent for 1888. It is also possible to derive such proportion factors from the statistics of the gainfully occupied population. However, in view of the fact that many fishermen are at the same time farmers, the number of persons gainfully occupied as recorded in official statistics is not a very good guide for estimating the proportion between gross values produced in fisheries and agriculture.

(ii) 1889–1893: The fisheries sector may be broadly divided into three groups, namely, fish and shell, aquatic products (such as dried fish, fish fertilizer, fish oil, etc.) and salt. For this period we have only the data for the latter two groups. Therefore we estimated the proportion factor of the first group relative to the latter two on the basis of empirical data for 1894–98. It turned out to be 92 per cent.

(iii) 1894–1942: Official statistics of gross value produced are available for this period. We used them without modification.

(*b*) *Net Income Ratios*

We have calculated two sets of net income ratios, one for agriculture, forestry, and livestock and dairy industries, and another for fisheries. It must be admitted that our estimate of income ratios is still in an extremely crude stage and leaves much room for improvement in future.

Agriculture, forestry, and livestock and dairy industries

(i) 1878–1913: There exist a great many individual studies of net income ratios in agriculture for scattered years. A number of them are contemporary studies dating as far back as 1874. On the basis of these, we have assumed in the first instance a declining trend of net income ratios starting with 88 per cent for 1878 and ending with 82 per cent for 1906–13. Since net income ratios in agriculture are affected significantly by year-to-year

changes in the price of cost goods (such as commercial fertilizer) on the one hand, and by those changes in the per-area yield which are not related to the amount of cost goods commercially purchased on the other, we have corrected our first approximation by applying the following formula for each year:

$$1-c\left\{\frac{2}{3}\left(\frac{\beta}{\alpha}-1\right)+\frac{1}{\gamma}\right\}$$

where c stands for cost ratio as obtained from our first approximation, α for the price of rice as expressed in the form of a relative to the decade average, β for the price of herring fertilizer as expressed in the form of a relative to the decade average, and γ for the per-area yield of rice as expressed in the form of a relative to the decade average. It is implied in this formula that commercial fertilizer occupies two-thirds of the commercially purchased cost goods. The assumption underlying the formula is that if the relative price situation of rice and herring fertilizer is same as that of the decade average (of the decade in which that year belongs), and if the per-area yield of rice maintains exactly the level of its decade average, then we need not revise the net income ratio as estimated in our first approximation.

(ii) 1914–1942: We used Professor Yuzo Yamada's figures without revision. For the years before 1931 his series is simply that of the National Research Institute of Agriculture[1] raised uniformly by 5 per cent on the ground that the latter overestimates the value of purchased cost items. For the years after 1931 he uses the adjusted figures of income ratios as calculated from the *Noka Keizai Chosa* (Agricultural Economy Survey).

Fisheries

Here again we have various statistics for scattered years giving us clues for estimating net income ratios. Especially the Cabinet Bureau of Statistics census of 1930 is useful in this regard. Using this and other sources Professor Yamada estimated, starting from 1903, net income ratio series for each of the three groups in this sector, namely, fish and shell, aquatic products and salt. We took the weighted average of the three ratios for 1903–07 and applied it all the way through. The resulting ratio is 54 per cent.

[1] The National Research Institute of Agriculture (Nogyo Sogo Kenkyujo), Kokumin keizai ni okeru nogyo shotoku no yakuwari. *Nogyo Sogo Kenkyu*, October 1948, p. 140.

2. *SECONDARY INDUSTRIES*

As for manufacturing, the starting-point of our estimate is that of Professor Yuzo Yamada. In general terms the method he used is as follows: first he divides this sector into factory production and domestic manufacture. The main problem for him then is (a) to estimate the net income ratio for factory production, (b) to estimate the gross value produced in domestic manufacture, and (c) to estimate the net income ratio for domestic manufacture. For gross value of factory production he makes use of the existing figures. The solution to the first problem above cannot be more than rough guesswork, so far as the years before 1930 are concerned. He uses a flat 40 per cent as a probable ratio for 1878–1929. For more recent years he can make use of detailed factory statistics in estimating such a ratio. In estimation of gross value of domestic manufacture the method he employs is rather crude. For 1878–1885 he assumes outright that the gross value of domestic manufacture was twice as high as that of factory production, and for 1886–95 50 per cent higher. For the years after 1895 the ratios of the number gainfully occupied and of productivity between the two sectors are utilized in estimating the gross value of domestic manufacture. Then finally, the net income ratio is assumed to be 60 per cent for 1878–99 and 55 percent for 1900–42. What we have done is to make a major revision on Yamada's method as regards (a) and (b) above; and we shall outline our process of revision in the following pages.

As for mining, Professor Yamada's estimates run only from 1897 on. We used them without revision. Here again, the method is quite similar to that used for other industries. He first obtains gross value of production, and then applies the net income ratio of 80 per cent for 1897–1929 and the specifically estimated ratios for the years after that. For earlier years we assumed that the net income from mining occupied a certain percentage of that from manufacturing: 3 per cent for 1878–84 and 5 per cent for 1885–96. These percentages were guessed at on the basis of the known similar percentages for 1897–1900 (which ranged from 6 to 7).

(*a*) *Net Income Ratio for Factory Production*

Since a major weakness in Professor Yamada's method here lies in the use of a flat 40 per cent for such a long stretch of

dynamic years as from 1878 to 1929, we tried to correct this weakness by applying the net income ratio of each subdivision of manufacturing to gross value produced of that subdivision. For this purpose we took net income ratios of subdivisions for 1930 as estimated by the Cabinet Bureau of Statistics, and assumed them to have been constant throughout the entire period from 1878 to 1929.[1] Such a procedure will enable us to take into account changes in industrial structure over the long stretch of years. For example, the net income ratio for factory production as a whole derived as a composite figure according to our method comes out to be between 25 and 27 per cent for most of the years in the nineteenth century, whereas Professor Yamada had assumed the flat 40 per cent throughout. Of course, it is still questionable if we can assume the estimated 1930 ratio for each subdivision to be valid for all the years back to 1870's. The development of various forms of industrial combinations, for one thing, tends to raise the net income ratio in that industry. However, data available thus far are still insufficient to enable us to make a comprehensive revision in this regard.

(*b*) *Income Produced by Domestic Manufacture*

The main reason why Professor Yamada resorted to an extremely arbitrary method of applying a certain multiple to gross value of factory production in order to obtain that of domestic manufacture for the years before 1896 was that it was not possible to obtain a reliable breakdown of the number of gainfully occupied in manufacturing into those in factory production and those in domestic manufacture. For the years starting from 1896, for which we have better information on industrial population, he used the following formula in order to estimate income produced by domestic manufacture:

$$Y_d = \frac{V_m}{N_m} \cdot f \cdot N_d \cdot e_d$$

where Y_d stands for income produced in domestic manufacture, V_m for gross value of factory production, N for the number of gainfully occupied with appropriate subscript for each of the

[1] Income ratios for subdivisions used in our revision are as follows: textile, 17.78 per cent; forest products, 33.09 per cent; printing, 55.86 per cent; food-processing, 28.04 per cent; metals, 20.90 per cent; machinery, 47.63 per cent; chemicals, 39.95 per cent; ceramics, 61.44 per cent; public utilities, 49.86 per cent and miscellaneous, 32.05 per cent. The weighted average for these is 33.94 per cent.

two divisions, f for the ratio of productivity per head of the gainfully occupied population, and e_d for the net income ratio in domestic manufacture. Since we have used Professor Yamada's net income ratios without any modification, that is to say, 60 per cent for 1878–99 and 55 per cent for 1900–42, the major work of our revision consisted in obtaining the consistent series of gross value produced in domestic manufacture, that is V_d, throughout the entire period. For this purpose we have reformulated the above equation as follows:

$$\frac{V_d}{V_m} = \frac{N_d}{N_m} \cdot f$$

or, rewriting $N_d N_m$ as n,

$$V_d = V_m \cdot n \cdot f$$

In this equation V_m is already given. So the remaining problem is how to estimate the values of n and f. For more recent years, for which we have fairly accurate figures for N_d and N_m, it is immaterial whether we use these absolute numbers for our purpose or we derive the ratio n. However, for earlier years for which we have a series of statistics of the total number engaged in manufacturing but for which we have no breakdown as to N_d and N_m, it is more convenient to have the formula in the above form, because it is possible to estimate the approximate value of n without having the complete statistics of N_d's and N_m's. And this is precisely what we have attempted to do. The procedure we have adopted is rather complicated and is based upon a wide variety of sources. Since we intend to make this a separate study by itself, we shall omit the detailed notes here and simply add that our estimate of n at this stage is anything but final.

As for the value of f, we may say in general that it must have declined as the time went on. Here again what we have is scattered information of various kinds from which we can derive its rough order of magnitude. It is natural that we have more complete data for recent years; and it is generally agreed that the value of f stood around 35 per cent at the time of the 1930 census and thereabouts. On the basis of this fact and with the aid of other statistics, including the trend of real product per head of the gainfully occupied population in factory production, we have assumed that the value of f changed in the following manner:

1878–1908	50 per cent
1909–1914	45 ,,
1915–1925	40 ,,
1926–1933	35 ,,
1934–1942	30 ,,

Since 1939 the government started compiling statistics of gross value produced in domestic manufacture. Our estimates based upon the above formula come very close, for 1939–42, to the independent estimates by the government, that is, about 97 per cent on average.

3. *TERTIARY INDUSTRIES*

For the period 1930–42 we have a fairly accurate estimate by the Economic Stabilization Board as modified by Professor Yuzo Yamada. Therefore, we used this series without revision. For the period 1919–29, probably the best consistent estimate thus far is that by Mr. Hijikata. However, this does not make use of the 1930 census and does not easily connect itself with the series we used for the later period. Since Professor Yamada developed, for the period from 1919 to date, a consistent series of income distributed in tertiary industries so far as labor income and proprietor's income are concerned, we made a comparison on this series between Yamada and Hijikata, found the difference between the two for each year, and adjusted by this difference the total income produced series of Hijikata's.

For the period before 1919, data available are so limited that the choice in method left for us cannot but be an extremely indirect one. Since we have statistics of the number of gainfully occupied in tertiary industries, of price index and of wage index, the crudest approximation would be to take the income per head of the gainfully occupied population (in tertiary industries) for a recent year for which we have better information (for example, 683 yen in the 1930 census year) and extend it backwards either with the wage index or with some combination of price and wage indexes. If we use the wage index, it would mean that productivity in tertiary industries rose *pari passu* with the labor productivity in manufacturing industries as reflected in the changes of wage level. To the extent we combine the movement of price index in this procedure, we would be assuming that productivity in tertiary industries did not rise as fast as that in manufacturing. By pursuing this general line of approach we

experimented with a number of combinations. But the results obtained were not very satisfactory when checked against the various scattered pieces of information we possess. Therefore we finally adopted an eclectic method of combining the use of Pareto coefficients with adjustment by means of price and wage indexes.

Pareto contended that the cumulative frequency curve of wage and property income together would be a straight line on double-logarithmic grids, even for the lower income range. However, empirical investigations by Professor M. Hayakawa[1] have shown that the straight line obtained from the data of income above tax-exemption level should not be extrapolated to lower income levels and that such a line should rather bend around the neighbourhood of the modal income class. This would mean that total income estimated on the basis of straight-line assumption has to be reduced by a certain percentage in order to arrive at the correct figure of income distributed. At the same time, this rate of reduction depends upon the percentage of income recipients who are covered in the data from which the Paretian straight line is derived. If the data used are the income tax data as in the case of Japan, this percentage is the percentage of incomes above tax-exemption level; and it becomes smaller and smaller as we go back in time. In other words, we may assume that the straight line we derive from income tax data holds longer into the non-tax-paying income group in the earlier years than in the more recent period. Thus the rate of reduction we may apply becomes smaller as we recede back in time.

What we have done essentially is firstly to estimate the total income of the non-tax-paying group on the basis of extrapolation of Pareto coefficients (estimated by Professor Saburo Shiomi)[2] and the reduction rates we have developed, then to add to this the adjusted total of tax-payers' income and other non-distributed incomes, and thus to obtain the estimated total income which can be regarded to correspond to the total of income produced. We can do this only for the period starting from 1887 inasmuch as the Shiomi series of Pareto coefficients begins only from that year. After the total income was obtained in this

[1] Miyoji Hayakawa, The Application of Pareto's Law of Income to Japanese Data, *Econometrica*, April 1951.

[2] Saburo Shiomi, *Kokumin Shotoku no Bumpai* (revised edition), 1941.

manner, the incomes produced in primary and secondary industries were deducted in order to derive income produced in tertiary industries as a residual. In carrying out this operation, however, we have made further adjustments of a minor character, such as taking into account the changing trend of price differentials between the city (where most of the income tax payers come from) and the country.

For the period before 1887 our method becomes still more indirect. There are two choices for us: either to obtain, from the figures of the immediately following period, the ratio of income per head of the gainfully occupied population in tertiary industries to that in primary and secondary industries and then to apply this ratio to the period before 1887, or to derive a trend line from the known figures and extrapolate it backwards. We tried both methods and compared the results with various pieces of relevant information, and finally decided to resort to an eclectic method. What we have done is to use the extrapolation method for the years from 1883 to 1886 (on the basis of the trend of income per head of the gainfully occupied population from 1887 to 1898) and to use the ratio method for the earliest five years under survey.

IV. NATIONAL INCOME IN CONSTANT YEN, 1878–1942

Table II gives the quinquennial averages of *national income produced in constant yen* both in absolute figures and in index form. The constant yen is that of 1928–32 average prices, and the growth of the series is indicated in index form by taking the first five-year period as 100.

As deflator we used the wholesale price index for both the goods-producing sector (primary and secondary industries) and the total national income, if for no other reason than that it is by far the best index we have for the seventy years under survey. We felt it might be better to use the cost of living index in deflating the total national income and attempted to construct such an index for the purpose. It turned out, however, that it had a much less steep trend than the wholesale price index, with the discrepancy as high as 35 per cent in earlier years (the average of 1928–32 being the base period). In order not to exaggerate the difference in real figures artificially between the net income in the goods-producing sector and the total national income, we have here applied the same wholesale price index to both series.

The result shows that in terms of the index the two series move almost in parallel fashion during the entire period under survey except that the total national income rises faster than the goods-producing sector. Roughly, we may say, the national income of Japan increased in real terms by about ten times during the seventy years preceding the Second World War.

TABLE II

National Income Produced

(Constant million yen, in 1928–32 prices)

	Goods-producing Sector		Tertiary Sector		Total National Income	
	Value	Index	Value	Index	Value	Index
1878–82 . .	1,150	100	495	100	1,645	100
1883–87 . .	1,302	113	680	137	1,932	117
1888–92 . .	1,540	134	1,017	205	2,557	155
1893–97 . .	1,974	172	1,115	225	3,089	188
1898–02 . .	2,540	221	1,373	277	3,914	238
1903–07 . .	2,589	225	1,800	364	4,388	266
1908–12 . .	3,079	268	2,095	423	5,175	315
1913–17 . .	3,500	304	2,332	471	5,831	354
1918–22 . .	4,152	361	2,978	601	7,129	433
1923–27 . .	4,541	394	4,212	851	8,753	532
1928–32 . .	5,625	489	6,151	1242	11,543	701
1933–37 . .	7,337	637	6,991	1412	14,327	870
1938–42 . .	10,025	873	7,388	1492	17,413	1058

Technical notes

There is no single unified wholesale price index for Japan for the period under consideration. Therefore, we constructed one by linking a number of them, mainly of the Bank of Japan. The following is the outline of our procedure:

(i) 1878–1892: For this period we built our own index, making use of price information on twenty commodities and giving weights in accordance roughly with their proportions in family expenditure during this period. This index can be linked to the so-called 'Old Bank of Japan Index of Tokyo Prices' which starts in 1887. The movement during the overlapping period between the two series is found to be very close; and this fact enables us to link the two.

(ii) 1893–1900: We take the 'Old Bank of Japan Index of Tokyo Prices' for this period. This index actually extends to

1907 and overlaps with the Bank of Japan wholesale price index with 1900 as base. The movement of the two series during the overlapping period (1899–1907) is again very close; and this fact enables us to link the two.

(iii) 1901–1930: In the 1930's the Bank of Japan revised its wholesale price index and started a new one with 1933 as base, and in linking this with the old 1900-base index the Bank of Japan took 1931 as the connecting year. This we found to be rather inadequate, for the old index is constructed as a simple arithmetical average and the new one as a weighted average, and the former is likely to understate the amplitude of the cycle. If we took for connecting purposes 1931, which was the worst year of the depression in Japan, we were likely to give an upward bias to price levels of earlier years. Therefore, we reverted to the linking process of the Bank of Japan and took as a link the average of three years, 1934–36, and used the relative movement of the old Bank of Japan index for the period 1901–30.

(iv) 1931–1942: For this period the new Bank of Japan index with 1933 as base is used except for the last four years. For these years adjustment is made on the basis of the Morita index in order to take into account the appearance of black market prices which are not reflected in the Bank of Japan index.

The resulting wholesale price index (1928–32=100) in quinquennial averages is as follows:

1878–82	41.7	1913–17	81.2
1883–87	31.6	1918–22	150.4
1888–92	37.1	1923–27	139.6
1893–97	41.7	1928–32	100.0
1898–02	53.1	1933–37	107.4
1903–07	63.7	1938–42	184.6
1908–12	68.5		

As has been mentioned before, this series indicates a rise of about five hundred per cent between the beginning and the end of the period under survey. The rise is especially marked if we focus our attention to a narrower range of 1880's to the early 1920's, 400 per cent in less than forty years.

V. PER CAPITA NATIONAL INCOME

1. *Per head of population*

Table III gives the quinquennial averages of per capita income in *constant* yen (1928–32 prices) both in absolute figures and in index form.

TABLE III

Per Capita National Income

(Constant yen, in 1928–32 prices)

	Value (yen)	Index (1878–82 = 100)
1878–82 . .	46	100
1883–87 . .	51	111
1888–92 . .	63	137
1893–97 . .	73	159
1898–02 . .	87	189
1903–07 . .	92	200
1908–12 . .	101	220
1913–17 . .	106	230
1918–22 . .	124	270
1923–27 . .	144	313
1928–32 . .	184	400
1933–37 . .	207	450
1938–42 . .	242	526

Here the national income figures are taken from Table II (total national income produced in constant yen), and the population we used is the one called 'registered population of Japan'. Since a Japanese national is 'registered' in Japan even if he is abroad, the registered population is usually higher than the actual number of Japanese residing in Japan, especially after the period of large emigration began. Thus it is likely that the figures in Table III after 1890 under-estimate the per capita national income of Japan. However, until we have a more reliable series of resident-population extending back to the early Meiji period, we have to be satisfied with this approximation.

A number of economists, including Professor Yuzo Yamada, have attempted to estimate consumption expenditures out of national income in the past. However, for the period before 1930 this can be done only by resorting to the crudest of indirect methods. Professor Yamada, for example, estimated his series of consumption expenditures back to 1887 by assuming that they were proportional to the changes of the income of the

non-income-tax-paying class.[1] We have felt that at the present stage of our research in national income statistics we ought to refrain from producing any 'guesstimates' of consumption expenditures for the entire period under consideration.

2. *Per head of the gainfully occupied population*

Table IV gives the quinquennial averages of income per head of the gainfully occupied population in constant yen (1928–32 prices) both in absolute figures and in index form.

TABLE IV

Per Gainfully Occupied Income

(Constant yen, in 1928–32 prices)

	Goods-producing Sector		Tertiary Industries		Total National Income	
	Value	Index	Value	Index	Value	Index
1878–82 . .	67	100	201	100	84	100
1883–87 . .	71	106	219	109	91	108
1888–92 . .	80	119	304	151	113	135
1893–97 . .	100	149	284	141	130	155
1898–02 . .	125	187	302	150	158	188
1903–07 . .	127	190	347	172	171	203
1908–12 . .	151	226	363	181	198	236
1913–17 . .	175	262	361	180	220	262
1918–22 . .	212	317	392	195	263	313
1923–27 . .	213	345	477	237	307	366
1928–32 . .	286	427	643	320	402	479
1933–37 . .	355	530	691	344	465	553
1938–42 . .	456	681	725	361	541	644

Here the main problem is the question of whether to include female workers in agriculture as gainfully occupied. Mr. Colin Clark, in his international comparison of productivity, found it better to exclude them in the case of Japan. Certainly there is a *rationale* for this procedure, especially because there are many other sectors of the economy where family members assist in the work in large measure, notably domestic manufacture and small-scale commercial establishments, and yet we usually do not include these family helpers as gainfully occupied. But it is also true that in the case of Japanese agriculture the extent of help which adult-female members of the family render in the course of the production process is almost indistinguishable

[1] Y. Yamada, *op. cit.*, pp. 93–97. See also his article: Japanese National Income (in English), *The Oriental Economist*, June 16, 23, and 30, 1951.

from that of male members. Therefore, we have felt that for the purpose at hand it would be better to leave the female agricultural workers in the category of gainfully occupied, whereas we have left out other female helpers from the category unless they are overtly employed. This procedure inflates disproportionately the number of gainfully occupied in the sector of agriculture. But until we shall be able to develop a more refined method of treatment on this entire question, we leave the figures in Table IV as they are.

It can be seen from Table IV that the income per head of the gainfully occupied population in tertiary industries had a relatively slow rate of growth when compared with that in the goods-producing sector; the former has risen only by 260 per cent in seventy years, whereas the latter increased almost seven times during the same period. Such a contrast in itself makes us suspect that something is wrong in one of the two series. It is more likely that our estimate of income in tertiary industries is more in error, considering the tenuous character of the method of estimate we employed. However, it is also possible to interpret this discrepancy in trend as reflecting the differing trend in the rise of productivity on the one hand and the gradual historical disappearance of semi-feudal monopoly elements in tertiary industries on the other. If we examine further the trend of income per head of the gainfully occupied population (in constant yen) in primary and secondary industries separately, we find that the advance in the former is only 229 per cent during the period under survey and that the advance in the latter is 533 per cent, as can be seen from the following tabulation:

	Primary	*Secondary*	*Tertiary*
1878–82	100	100	100
1908–12	203	176	181
1938–42	329	633	361

Up until the beginning of the First World War the advance is almost parallel in all the three sectors; and in the thirty years after this period the secondary sector shows the most rapid growth, the tertiary doubles itself, and the primary rises only by 60 per cent. This, we may say, is a plausible picture.

It may seem incongruous to some that the index number for the total national income is higher than either one of the

components for a number of periods in Table IV. But this is accounted for by the fact that the relative proportion of the number of gainfully occupied changes through these years steadily in favor of those industries which have higher absolute per capita income. Such circumstances can render the base period figure of total average *relatively lower* than that of its components.

Inaccurate as the statistics are, we may say on the basis of Table IV that the income per head of the gainfully occupied population in Japan increased by more than six times in the course of the seventy years under review.

VI. THE RATE OF GROWTH, 1878–1942

Thus far we have given our statistical figures in terms of quinquennial averages. But in Table V we have calculated rates of change of aggregate figures between contiguous decades in two sets, one set being the decade of 3 to 2 and the other being that of 8 to 7.

TABLE V

Rates of Percentage Change Per Decade of National Income

(In constant yen)

	Goods-producing Sector	Total National Income
A. Contiguous Decades (3–2):		
1883–92 to 1893–02 . .	58.8	56.0
1893–02 to 1903–12 . .	25.6	36.6
1903–12 to 1913–22 . .	35.0	35.5
1913–22 to 1923–32 . .	32.9	58.1
1923–32 to 1933–42 . .	70.8	54.8
B. Contiguous Decades (8–7):		
1878–87 to 1888–97 . .	43.3	57.8
1888–97 to 1898–07 . .	46.0	47.0
1898–07 to 1908–17 . .	28.3	32.6
1908–17 to 1918–27 . .	32.1	44.3
1918–27 to 1928–37 . .	49.1	64.5

Both the goods-producing sector and the total national income show a sag in the middle (just around the period before the First World War) and then rise again and give no indication of stagnation until the start of the Second World War.

Table VI gives similar rates of change per decade of per capita income figures. The first two columns are rates of change for the income per head of the gainfully occupied population and the last one is for the per capita figure of national income.

TABLE VI

Rates of Percentage Change Per Decade of Per Capita Income

(In constant yen)

	Per Gainfully Occupied		Per Head of Population: Total National Income
	Goods-producing Sector	Total National Income	
A. Contiguous Decades (3–2):			
1883–92 to 1893–02 . .	49.0	41.2	40.4
1893–02 to 1903–12 . .	23.6	28.1	20.6
1903–12 to 1913–22 . .	39.2	30.9	19.2
1913–22 to 1923–32 . .	33.6	46.8	42.3
1923–32 to 1933–42 . .	56.9	41.9	37.2
B. Contiguous Decades (8–7):			
1878–87 to 1888–97 . .	30.4	38.9	40.2
1888–97 to 1898–07 . .	40.0	35.4	31.6
1898–07 to 1908–17 . .	29.4	27.1	15.6
1908–17 to 1918–27 . .	35.9	36.4	29.5
1918–27 to 1928–37 . .	44.7	52.4	45.8

Here again the general picture is similar to that in the previous table. Far from showing a sign of stagnation, the rate of change per decade bounces back again to more than the 40 per cent level in the more recent period.

In order to judge the pattern of growth more clearly, we have calculated in Table VII the rate of change between overlapping decades in terms of average rate per year, and juxtaposed a similar figure for total population.

From this table we find that the average rate of change per year, for total national income, comes to slightly above 4 per cent (4.07 per cent) for the entire period under survey. The average for the goods-producing sector is a little lower, that is, 3.63 per cent. In both series the period from the latter part of the 1880's to the early twentieth century is shown to be a rather rapid period of growth. Then there is a sag in the rate of growth, to be followed by an exceptionally high rate after the First

TABLE VII

Rate of Change Per Year between Overlapping Decades

(Aggregate figures in constant yen)

	Goods-producing Sector	Total National Income	Population
1878–87 to 1883–92	3.0	4.6	1.2
1883–92 to 1888–97	4.3	4.7	1.1
1888–97 to 1893–02	5.1	4.4	1.0
1893–02 to 1898–07	2.6	3.5	1.2
1898–07 to 1903–12	2.0	2.9	1.3
1903–12 to 1908–17	3.0	2.9	1.4
1908–17 to 1913–22	3.1	3.3	1.3
1913–22 to 1918–27	2.6	4.2	1.2
1918–27 to 1923–32	3.2	5.3	1.4
1923–32 to 1928–37	5.0	5.0	1.5
1928–37 to 1933–42	6.0	4.0	1.0

World War. The rate of growth of the goods-producing sector is as high as 6 per cent per year for the overlapping decades of 1928–37 to 1933–42. Since the average rate of change in Japan's population is fairly steady throughout the entire period, the above conclusion will not be affected very much if we measure the rate of change in terms of per capita figures rather than the aggregate.

3

LA CROISSANCE ÉCONOMIQUE FRANÇAISE

par des membres de l'Institut de Science Economique Appliquée

I. INTRODUCTION PAR LE PROFESSEUR FRANÇOIS PERROUX

Le document qu'on va lire, présenté par l'I.S.E.A. à la réunion de 1951 de l'I.A.R.I.W., comporte deux parties: le rapport proprement dit, qui rassemble des chiffres globaux plus ou moins représentatifs du revenu national français pour un certain nombre d'années depuis 1780, et une annexe qui établit des comptabilités nationales sommaires à trois dates éloignées.

Cette présentation a été choisie par souci de fidélité à ce qui nous était demandé. Livrés à nous-mêmes, nous eussions présenté une série de structures dans le rapport fondamental et renvoyé en annexe le relevé des revenus globaux: la croissance n'a de signification pour nous que comme phénomène de transformation des structures dont il ne peut-être rendu compte, comme le dit G. Th. Guilbaud, par 'l'histoire d'un chiffre unique'. J'ai eu maintes occasions, dans des articles et des cours, de manifester mes propres positions sur ce point; il m'a été précieux de me trouver en accord avec mes amis de l'I.S.E.A.

Je remercie très vivement les auteurs des textes qui suivent:

— Jacques Mayer, dont la 'Note sur la structure de l'Économie française à trois époques éloignées' constitue une très importante contribution au travail de notre équipe et représente une remarquable et scrupuleuse analyse des documents originaux;

— Jean Albert et Marcel Malissen, qui ont procédé avec beaucoup d'intelligence et de persévérance à la recherche et à l'interprétation des sources;

— G. Th. Guilbaud, qui a guidé Albert et Malissen dans leurs recherches et a mis en œuvre les résultats de celles-ci en établissant l' 'État provisoire des recherches' sur 'Le revenu national français de 1780 à nos jours'.

Je m'associe pleinement aux réserves de Guilbaud sur la signification de la tâche ingrate qu'il a bien voulu assumer et à son espoir de présenter un jour un véritable tableau de la croissance économique française sous la forme d'une *histoire raisonnée* 'du système de chiffres que constitue une comptabilité nationale'.

François Perroux

II. LE REVENU NATIONAL FRANÇAIS DE 1780 À NOS JOURS

1. La plupart des chercheurs qui ont eu besoin de connaître le revenu national français à diverses époques ont déclaré que la documentation est relativement abondante. C'est ce que dit A. de Foville,[1] c'est ce que répète Colin Clark dans *The Conditions of Economic Progress*,[2] 'for the period between 1789 and 1911, it is literally true to say that estimates of national income in France were as numerous as for the rest of Europe'. Et de fait il ne serait pas difficile d'établir une liste très longue même en excluant les simples répétitions: pour le cours du 19ème siècle Foville donne 15 estimations, Robert Meyer en donne 10, Clark une trentaine; quant à nous, après examen et sélection, nous en présenterons une cinquantaine, à peu près uniformément réparties dans le temps.

Mais à collectionner les évaluations, on risque fort de voir se constituer une sorte de Vulgate qui se transmettra de texte en texte, même lorsque les auteurs accompagnent leur tableau de chasse de réserves importantes sur la signification douteuse et l'hétérogénéité certaine d'un grand nombre de sources. Notre premier dessein a donc été de remonter à l'origine pour chaque chiffre allégué, surtout pour les chiffres souvent recopiés, de dresser un tableau (dont ou trouvera ci-après la forme provisoire) présentant les sources, les estimations et leur portée. Mais ce tableau, même très critique, ne pouvait être notre but: c'était plutôt un sous-produit de notre travail de recherches. Pour nous, la collecte des chiffres globaux du revenu national annuel en France depuis 1780, et l'étude subséquente de l'évolution de ce revenu, ne présentent qu'un intérêt mineur: ce ne peut être qu'une introduction à l'histoire, non d'un chiffre unique, mais du système de chiffres que constitue une comptabilité nationale. Notre objectif fondamental est, en effet, de rassembler les matériaux nécessaires à une étude de la croissance de l'économie française, dont nous pensons qu'elle ne peut se faire si les chiffres ne sont pas suffisamment décomposés et si, pour le dire de façon brève, nous n'arrivons pas à éclairer le 'financement' de la croissance. Cependant, comme nous l'avions espéré, la prospection préliminaire des sources nous a prouvé que l'éta-

[1] A. de Foville, *La Richesse de la France et la France Economique*, 1890, p. 506.
[2] Colin Clark, *The Conditions of Economic Progress*, Macmillan, 1st edition, 1940, p. 99; 2nd edition, 1951, p. 71.

blissement de comptabilités nationales échelonnées à diverses dates depuis 1780 est loin d'être impossible.

2. Il existe de nombreuses listes groupant des estimations de diverses provenances (Foville, Vignes, Neumann-Spallart, Robert Meyer, Simiand, Colin Clark, etc.), mais aucune ne peut être directement utilisée faute d'avoir associé aux chiffres des commentaires suffisants. D'autre part, à force de recopies mutuelles et parfois insouciantes, les doublets deviennent inévitables; ainsi on pourrait s'émerveiller de quelques beaux accords tels que:

1892.	Neumann-Spallart	25 milliards
1893.	Foville	25 milliards

que nous trouvons chez Clark. Mais les *Uebersichten* du premier auteur se contentent de citer le second dont, par contre, l'estimation est originale et, bien que sommaire, présentée avec justifications. D'une façon générale, la méfiance doit être de règle chaque fois que l'on trouve deux chiffres identiques: dans la liste de Clark, la règle est efficace à quatre reprises. Le danger d'utiliser des listes toutes faites et d'attribuer la responsabilité des chiffres à un auteur qui n'a fait que glaner (bien souvent au hasard) apparaît encore plus grand quand on constate, par exemple, que Colin Clark écrit: 'Of the various discrepant series included in the previous table, Neumann-Spallart's have at least the merit of having been prepared by a single author, and probably were to some extent reckoned on a comparable basis. They should, therefore, be given more consideration than the others,'[1] et quand, se reportant à l'ouvrage de Spallart[2] on s'aperçoit que celui-ci nous donne seulement un recueil d'évaluations faites par divers auteurs et qu'il emprunte lui-même à Robert Meyer et à Foville. La liste de Meyer, qu'on trouve dans le *Handwôrterbuch de Conrad* est d'ailleurs plus étendue que celle de Spallart mais elle n'est pas non plus originale: sa source principale est l'ouvrage de Schnitzler;[3] la liste de Schnitzler est prolongée après 1848 par diverses évaluations postérieures et Meyer signale pour certaines qu'il s'agit d'estimations faites en passant et sans grande valeur statistique. Cette prudence, qui se perdra avec les recopies, est tout à fait justifiée. Ainsi l'une

[1] Clark, *op. cit.*, 1st edition, p. 103; 2nd edition, p. 74.
[2] Neumann-Spallart, *Uebersichten der Weltwirtschaft.*
[3] Schnitzler, *De la Creation de la Richesse*, Paris, 1842.

des sources, qui figure finalement dans le Tableau de Clark sous l'autorité vantée de Spallart,[1] est un article de Michel Chevalier dans *la Revue des Deux-Mondes*[2] dont il nous suffira de citer un passage essentiel: 'c'est exagérer, selon toute apparence, la production totale de la France en produits matériels que de la mettre à 10 milliards. Supposons que demain par un décret révolutionnaire, on installe le système communiste en France, . . . et que chaun des 35 millions de Français ait à prendre son lot égal sur les 10 milliards: ce sera par tête 78 centimes à dépenser par jour. Chaque ouvrier non marié sera mis à 78 centimes: je n'en sache pas beaucoup à Paris qui se contenteraient de ce traitement-là, même au nom de la République . . .'

Pareille méprise n'est pas heureusement très fréquente: l' 'estimation' que nous venons de citer est probablement de beaucoup la moins solide que nous ayons rencontrée. Il ne nous est pas interdit d'ailleurs de la conserver dans notre collection et de comparer cette impression d'un contemporain avec des évaluations plus sérieusement justifiées· il n'est pas indifférent de savoir en quelle mesure l'opinion concordait ou non, à l'époque, avec les statistiques valables.

Outre les erreurs assez grossières dont nous venons de donner quelques exemples, il importe de signaler aussi l'attribution de l'étiquette: Revenu ou Produit National, à des sommes globales qui ne la méritent guère ou qui même n'y prétendaient pas dans l'esprit du calculateur original. Ainsi le chiffre de 11.3 milliards donné par Clark pour 1860 est une conversion en francs des 450 millions de livres sterling que Leone Levi attribue au Revenu français[3] et qu'il a lui-même tiré, par conversion, des 11.121 millions de francs que Maurice Block attribue à la production industrielle totale; la confusion vient de ce que Block oppose sa propre estimation à celle de la statistique officielle qui ne concernait que la grande industrie. L'erreur de Levi sera répétée un peu plus tard par Edouard Vignes qui cherche en 1864 à obtenir une somme de revenus distribués égale à 11 milliards. Vignes est d'ailleurs récidiviste: dans son *Traité des Impôts*[4] souvent cité, il donne pêle-mêle des chiffres globaux concernant

[1] Pour être juste, reconnaissons que Clark refuse toute signification aux évaluations antérieures à 1860. Mais c'est justement ce que nous contesterons: les chiffres de la fin du siècle ne nous semblent pas les meilleurs.

[2] Michel Chevalier, Question des Travailleurs, *Revue des Mondes*, 15 Mars, 1848, p. 1067.

[3] Leone Levi, Journals of the Royal Statistical Society, 1860, p. 42.

[4] Vignes, *Traité des impôts en France*, Paris, 1880.

toutes sortes de catégories distinctes (revenus imposables, produit net du sol, production industrielle, etc.) et sa liste recopiée par Foville a souvent passé toute entière chez les auteurs postérieurs sauf chez ceux qui ont tout rejeté par impatience ou mauvaise humeur; il vaut mieux faire un tri, et c'est presque toujours possible. Il est clair, par exemple, que les 6 milliards[1] d'Hippolyte Passy, (projet de loi, 1849) ne correspondent qu'à une assiette possible d'un futur impôt et non pas à un produit ni à la masse du revenu distribué. Les chiffres partiels, pourvu qu'ils soient expliqués et justifiés ne sont pas du tout négligeables pour notre but; il convient seulement d'éviter les confusions.

3. Commençons par mettre à part les sources de documentation incomplète pour constituer ensuite une liste des estimations globales qui pourraient concourir à donner une idée de la croissance du produit national français. On trouvera dans la Note A[2] l'inventaire des sources incomplètes, dont quelques-unes sont très importantes et ont été utilisées par la suite. Dans notre premier essai de collection, nous avons décidé d'être aussi peu sévères que possible, acceptant toute estimation, sous bénéfice d'inventaire, pourvu qu'elle se présente avec le minimum de garanties: nous avons dû évidemment tenir compte de la personnalité de l'auteur, des sources qu'il cite ou que l'on peut présumer qu'il a connues, et surtout du fait que toute évaluation globale doit être présentée comme une somme d'éléments déterminés. Il ne s'agit cependant pas d'un palmarès: seule une étude ultérieure approfondie permettra de porter un jugement sur la réalisation concrète des intentions propres de chaque auteur. Pour le moment, nous nous contentons d'enregistrer et de comparer.

La comparaison soulève immédiatement un problème difficile: on peut définir un Revenu National de bien des manières.[3] Plutôt que de tenter une uniformisation arbitraire, nous avons préféré effectuer la comparaison en deux étapes. Dans la première, nous étudions uniquement les séries ou chaînes d'évaluations faites par le même auteur pour diverses époques.

Ainsi que nous l'avons déjà dit, nous ne pensons pas que l'étude de la croissance du chiffre global du Produit National soit d'un grand secours pour l'interprétation économique· aussi

[1] Cités par Vignes, puis Foville, puis Clark.
[2] p. 58.
[3] See Note B, p. 61.

notre projet comporte l'établissement d'une chaîne de comptabilités nationales tout au long de la période étudiée. Cette chaîne est en cours d'élaboration, les premiers résultats provisoires sont donnés dans la section III. Nous lui empruntons ici trois chiffres globaux: 1788, 1845, 1885 que nous comparerons aux données recueillies.

4. La question du taux de croissance du Produit National a été posée par un certain nombre d'auteurs: plus de la moitié des estimations dont nous pouvons disposer font partie de séries ou chaînes qui présentent pour nous un intérêt capital. Nous commençons donc par rassembler et comparer les estimations liées dans le temps, le Tableau 1 donne les chiffres et les sources: 35 estimations faites par 10 auteurs. Le diagramme 1 figure les évolutions correspondantes: l'échelle des valeurs (graduée en milliards de francs or) est logarithmique et choisie de façon que l'inclinaison à 45° corresponde à peu près à un taux de croissance de 2% par an, doublement en 35 ans. Comme il fallait s'y attendre, les divergences de points de vue influent notablement sur les valeurs absolues des résultats.

Mais ce qui apparaît très nettement, par contre, c'est un accord remarquable pour ce qui concerne l'allure générale de l'évolution: ce qui se marque sur le diagramme logarithmique par le parallélisme des chaînes. On est amené à penser que diverses définitions du Revenu National peuvent évoluer d'une façon grossièrement proportionnelle: ce qui s'accorde avec le fait que les décompositions principales d'une comptabilité nationale ne font apparaître que de très faibles et très lentes variations des proportions.

On pourrait même effectuer pour chaque chaîne une translation de façon à obtenir un groupement optimum des 35 points du diagramme. Une opération graphique suffit, dont le résultat est donné par le diagramme 2. Cette opération équivaut à une détermination analytique d'un taux typique de croissance autour duquel se distribuent les diverses estimations. On vérifierait sans peine que l'ajustement analytique revient à faire une moyenne pondérée des taux de croissance résultant des estimations individuelles de chaque auteur (Cf. Tableau 2).

On peut donc dire que la croissance du Revenu National a été, en gros, géométrique entre 1789 et 1914. Le taux moyen est un peu inférieur à 2% par an. (Taux annuel: 1,8; ou 20%

par décade.) Ce qui correspond à l'opinion reçuse[1] Si l'on veut décrire l'évolution du Revenu National d'après les données que nous avons produites ci-dessus, on dira simplement que le Revenu National a doublé en 39 ans ou a été multiplié par 6 au bout de 100 ans. Peut-on raffiner et donne une description des fluctuations? Il ne nous semble pas. Si, comme nous l'avons fait sur le diagramme 2, on enferme tous les points représentatifs dans une bande rectiligne, l'épaisseur de cette bande correspond à une incertitude de 15% en plus ou en moins. Or, on ne peut espérer que les erreurs inévitables de chaque estimation aient toujours été notablement inférieures à ce chiffre: on peut même avancer que dans tous les cas l'erreur à craindre est de cet ordre. Il ne nous paraît donc pas possible de considérer comme significatives les ondulations qu'on aperçoit sur le diagramme, malgré la tentation qu'on aurait d'y voir des cycles longs.

5. Toutes les évaluations dont nous avons fait état jusqu'ici sont esprimées en francs courants; chaque fois que l'on doit interpréter une série de chiffres décrivant l'évolution en termes monétaires d'une certaine quantité globale, revenu ou produit, on a l'habitude de dissocier deux composantes, l'une purement monétaire, l'autre que l'on dit 'réelle'. Il est certain qu'une hausse des prix ne doit pas être assimilée à une véritable croissance. Mais il importe de noter, pour le cas qui nous occupe, que jusqu'à 1914 les fluctuations de prix ont été relativement peu importantes. Sur le diagramme 3 ont été figurés, à l'échelle même des diagrammes 1 et 2, quelques indicateurs de la valeur de la monnaie: indices des prix, indices du coût de la vie. Compte tenu des incertitudes dont il a été question au paragraphe précédent, on voit que la réduction des chiffres bruts au moyen d'un indice monétaire n'aurait ici qu'un effet minime et probablement assez peu significatif. Si l'on tente cependant cette réduction, par exemple sur les données du diagramme 2, on obtient une légère diminution du taux moyen de croissance.

Par contre, pour prolonger l'étude au delà de 1914, il devient absolument nécessaire de tenir compte de la valeur de la monnaie. Dans le diagramme 4 nous avons raccordé les données antérieures à 1914 avec celles calculées en termes 'réels' par Vincent et Froment, d'après les estimations de Colson et Dugé de Bernonville. Il semble alors, mais il est peut-être prématuré

[1] See Sauvy, *Richesse et Population*, 2ième edition, p. 93.

de conclure, que le rythme général de croissance, commencé au moins à la fin du 18ème siècle, se soit assez profondément modifié après 1914.

Les données numériques utilisées pour la confection des diagrammes 3 et 4 figurent dans le Tableau 3. On a figuré, sur le diagramme 4, le mouvement de la population. On constate que ce mouvement a été très lent au cours de la période étudiée. Si l'on voulait calculer, comme de coutume, le revenu 'par tête', les résultats seraient peu modifiés, et on n'éclairerait guère les relations entre la croissance économique et la croissance démographique. On s'étonnera évidemment de voir que ces relations sont très peu apparentes. A l'échelle où nous opérons, la régularité de la croissance du revenu semble complètement indépendante d'une foule de circonstances, politiques ou autres, qui ont beaucoup varié depuis 1780!

6. Après avoir rassemblé les évaluations liées, nous devons leur comparer les évaluations isolées: c'est la deuxième étape annoncée ci-dessus. Le Tableau 4 rassemble 15 évaluations et le diagramme 5 les situe par rapport aux chaînes déjà présentées. Comme il a été convenu, nous faisons figurer aussi bien les évaluations solides et détaillées que d'autres beaucoup plus fragiles: on constatera cependant que la dispersion n'augmente guère. Il semble, par conséquent, que s'il ne s'agissait que de mettre en lumière le fait de la croissance et d'estimer un taux moyen, la précision fournie par nos sources serait tout à fait suffisante.

S'il s'agit, comme nous le pensons, d'interpréter le phénomène, alors la difficulté principale proviendra de la finesse nécessaire aux estimations statistiques: les phénomènes essentiels jouent à l'intérieur d'une marge qui, pour le moment, est comprise dans la marge d'incertitude générale.

TABLEAU 1

(Estimations liées du Revenu National Annuel en millions)

	Dupin	Dutens	Mayer	Cochut	Simiand-Clark	Froment	Pupin	Foville	Colson	Lascaux
1780 . .	4,011									
1788 . .	—	—	3,600							
1790 . .	4,655									
1800 . .	5,402									
1810 . .	6,270									
1815 . .	—	8,415								
1820 . .	7,862									
1827 . .	8,403									
1830 . .	8,808									
1835 . .	—	10,667								
1840 . .	10,000									
1845 . .	—	—	9,150							
1850 . .	—	—	—	—	9,700	14,200				
1851 . .	—	—	—	13,500						
1853 . .	—	—	—	—	—	—	12,281			
1859 . .	—	—	—	16,000						
1860 . .	—	—	—	—	—	22,700				
1866 . .	—	—	—	—	—	—	—	18,000		
1878 . .	—	—	—	—	—	—	21,902			
1880 . .	—	—	—	—	22,700	32,000				
1885 . .	—	—	24,300							
1889 . .	—	—	—	—	—	—	—	25,000		
1890 . .	—	—	—	—	—	—	—	—	25,000	
1895 . .	—	—	—	—	—	—	—	—	—	21,000
1899 . .	—	—	—	—	—	—	—	—	26,200	
1900 . .	—	—	—	—	25,700	36,800				
1905 . .	—	—	—	—	—	—	27,801			
1910 . .	—	—	—	—	33,500					
1911 . .	—	—	—	—	—	—	32,013			
1913 . .	—	—	—	—	—	50,700	—	—	36,100	
1914 . .	—	—	—	—	—	—	—	—	—	31,000

NOTES DU TABLEAU 1

DUPIN

Voir Ch. Dupin, *Forces productives et sociales de la France*, 2 vol., Paris, 1827.

Ch. Dupin, *Bien-être et concorde des classes du peuple français*, 1848 (Petits Traités publiés par l'Acad. Sc. Morales et Politiques, n° 12), 141 pp.

J. H. Schnitzler, *Statistique générale, méthodique et complète de la France*, Paris, 1846, 4 vol.

DUTENS

Joseph Dutens, *Essai comparatif sur la formation et la distribution du Revenue de la France en* 1815 *et en* 1835, Paris, 1842.

MAYER

Cf. ci-après Section III.

COCHUT

André Cochut, Philosophie de l'économie politique, *Revue des Deux-Mondes*, 1er avril 1859.

SIMIAND-CLARK

Les indices donnés par Simiand (*Le Salaire*, Paris; 1932, Tome 3, p. 107) ont été transformés en valeurs monétaires par Clark (*The Conditions of Economic Progress*, 2e ed., pp. 71 et 74).

FROMENT

René Froment, *Trois journées pour l'étude scientifique du vieillissement de la population* (avril 1948), *Alliance Nationale contre la dépopulation*, Paris, 1948, Fascicule IV, pp. 41 sqq.: *La part des vieillards dans le Revenu national*, pp. 42–43.

Cf. Fourastié, *Machinisme et Bien-être*, Paris, 1951, p. 96, note 2.

PUPIN

R. Pupin, *de la Richesse de la France devant la Guerre*, Paris, 1916.

FOVILLE

Dictionnaire des Finances publié sous la direction de Léon Say, 1883–1894; Article Richesse, pp. 103 sqq., par A. de Foville.

Cf. Levasseur, *Questions ouvrières*, Paris, 1907.

COLSON

C. Colson, *Cours d'Économie Politique*, Livre III, Paris, Gauthier-Villars, 1927, pp. 387–404.

LASCAUX

Robert Lascaux, *La production et la population*, Paris, Payot, 1921, pp. 251–254.

TABLEAU 2

Taux de croissance du Revenu National selon les évaluations du Tableau 1

1°) *Taux individuels*

On remarquera que les extrêmes correspondent à des chaînes courtes.

Evaluations de:	*Taux moyen annuel* %
Dutens	1,20
Foville	1,44
Pupin	1,56
Dupin	1,61
Colson	1,66
Froment	1,81
Mayer	1,96
Simiand[1]	2,01
Lascaux	2,08
Cochut	2,15
moyenne =	1,75

2°) Estimation d'un *Taux Moyen Général*

On trouve: Taux = 1,81% par an.

TABLEAU 3

1. Dans le diagramme 3 l'indice des prix de gros est celui des 45 articles publiés par la Statistique Générale de la France. Ceux du coût de la vie sont

   A): indice de March (dans: *Salaires et coût de l'existence à diverses époques jusqu'en* 1910; Paris, 1911, p. 105) reproduit par Sauvy, *op. cit.*, 2e ed., p. 71, et cité par Clark, *op. cit.*, 2e ed., p. 76.

   B): indice calculé par Portzamparc et Froment (dans: Institut de Conjoncture, *L'intérêt réel du capital*, Étude spéciale N° 1);

   C): indice calculé par Chabert, *Essai sur les mouvements des revenus et l'activité économique en France de* 1798 *à* 1820, Paris, 1949, p. 264 (si l'on compare cet indice à ceux de Simiand, *op. cit.*, Tome 3, p. 88, on verra qu'il s'agit bien plus d'un indice des prix que du coût de la vie proprement dit).

2. Les chiffres du Revenu National postérieurs à 1920 sont empruntés à l'Étude Spéciale N° 3 de l'Institut de Conjoncture: *Le progrès technique en France depuis Cent Ans*, Paris, 1944, Tableaux 20 et 32, pp. 109 et 122. Les donnés de base sont les évaluations de Colson et de Dugé de Bernonville, – réduites au moyen de l'indice (B) cité plus haut.

[1] La transformation de Clark n'est pas nécessaire; on peut ici traiter directement les indices de Simiand.

Tableau 3 (suite)

Voici les résultats (indice du Revenu National *réel*):

1901=100
1913=126,1

1920=114,0
1921=131,6
1922=142,8
1923=140,4
1924=148,5

1925=152,1
1926=146,0
1927=145,0
1928=155,1
1929=155,8

1930=147,3
1931=141,0
1932=137,7
1933×134,5
1934=125,1

1935=127,1
1936=139,6
1937=137,8
1938=134,8

TABLEAU 4

1788.	Tolosan. . . .	3 milliards (produits)
1789.	Neymarck . . .	entre 3 et 5
1791.	Renard	5,1 (consommation)
1804–10.	Chaptal . . .	6,1 (produits)
1812.	Montalivet . . .	7,0 (idem)
1830.	Fourastié . . .	8
1842.	Schnitzler . . .	7,7 (produits)
1848.	Chevalier . . .	10
1868.	Ayen	18 à 20 (revenus privés)
1870–74.	Wolowski . . .	20 à 22
1877.	Leroy-Beaulieu . .	25
1883.	Cochut	37,1
1889.	Neymarck . . .	entre 30 et 35
1890.	Coste	22,5
1905.	Lavergne et Henry . .	27,8

NOTES DU TABLEAU 4

TOLOSAN

Mémoire sur le commerce de la France et des Colonies, Paris, in-8°, 1789 (publié sans nom d'auteur) (Bibl. Nationale: V, 17.751).

NEYMARCK

Un centenaire économique, Journal de la Société de Statistique de Paris, 1889.

RENARD

Découverte de la valeur certaine du produit réel et absolu du sol de la France . . . par le sieur Renard (Bibliothèque du Ministère des Finances, Recueil, 12-3620).

CHAPTAL

De l'industrie française, Paris, 2 vol., in 8°, 1819.

MONTALIVET

Ancienne et nouvelle France, Paris, 1813.

FOURASTIÉ

Machinisme et Bien-Etre, Paris, 1951, pp. 90 et 96, note 2.

SCHNITZLER

Statistique générale, méthodique et complète de la France, Paris, 1846, 4 vol.

CHEVALIER

Questions des travailleurs, *Revue des Deux-Mondes*, 15 mars 1848.

AYEN

Journal des Économistes, 1875, p. 236.

WOLOWSKI

Cité par A. de Foville, *La Richesse de la France* (Extrait du dictionnaire des Finances de Say); cf. aussi Rouvier, discours du 3 janvier 1874.

LEROY-BEAULIEU

Cité par Levasseur, *Questions ouvrières*, Paris, 1907.

COCHUT

De l'enchérissement des marchandises et des services, *Revue des Deux-Mondes*, 1er décembre 1883, pp. 512–551.

COSTE

Étude sur le salaire des travailleurs et le Revenu de la France, *Journal de la Société de Statistique de Paris*, 1890.

LAVERGNE

Lavergne et Henry, *La Richesse de la France*, Paris, 1908.

NOTE A

Evaluations qui n'ont pas été prises en considération dans l'étude précédente

1. Lavoisier

Lavoisier avait entrepris un ouvrage 'de la Richesse territoriale du Royaume de France' dont la rédaction ne fut, semble-t-il, jamais terminée, mais dont nous possédons quelques éléments par: Résultats extraits d'un ouvrage intitulé: *De la Richesse territoriale du Royaume de France*, ouvrage dont la rédaction n'est point encore achevée; imprimé sur l'ordre de l'Assemblée Nationale, Paris, 1791. Cet opuscule a été réimprimé dans la *Collection des Principaux Économistes*, par E. Daire et S. de Molinari, Paris, Guillaumin, Tome 14, pp. 575 sqq., ainsi que dans les *Oeuvres de Lavoisier*, 6 vol., in-4°, Imprimerie impériale, Paris, 1864, Tome 6, pp. 403–463. Son importance est exceptionnelle, tant par les renseignements statistiques qu'il apporte, que par les conceptions théoriques (d'inspiration physiocratique) qu'il illustre, et les méthodes statistiques. Roederer, dans l'avertissement, signale que les commissions parlementaires de l'époque ont trouvé que les chiffres de Lavoisier étaient sous-estimés. Lavoisier s'efforce de chiffrer le Revenu *Territorial*, c'est-à-dire à peu près le produit brut de l'agriculture, qu'il évalue à 2.750 millions. Le produit net, c'est-à-dire le précédent diminué de la consommation des cultivateurs et auxiliaires, est de 1.200 millions. Les décompositions et les divers éléments statistiques allégués sont, pour nous, plus importants que ces sommes globales.

Cf. aussi, le travail de Lagrange sur les Besoins de la Nation, (*Collection des Principaux Économistes*).

2. P. de Delay (d'Agier)[1]

Député du Dauphiné à la Constituante qui en 1790, à l'occasion des réformes fiscales, a présenté dans une série d'*Opinions*, prononcées à l'Assemblée, quelques estimations assez détaillées des revenus fonciers et mobiliers.

Selon Delay, les revenus fonciers sont à peu près équivalents aux mobiliers, et chacune des deux sommes dépasse peu le milliard.

Il est cité par:

— Vignes, *Traité des impôts*, *op. cit.*, 4e édition, tome 2, p. 141, d'aprés Deparieu.
— Foville, *La Richesse de la France et la France Économique*, *op. cit.*, d'après Vignes.
— Clark (sous le nom: 'D'Agier'), dans 'The Conditions', *op. cit.*, d'après Foville.

[1] On écrit aussi Dedelay, Dedelley, Delai.

Ses estimations peuvent être rapprochées de celles de Lavoisier pour les produits agricoles. Elles comportent des chiffres pour les loyers urbains; les salaires publics, la dette publique. Ce sont ces chiffres partiels qui sont les plus utiles. La somme totale (que donne Clark) ne représente nullement un produit national: l'intention de l'auteur reste essentiellement fiscale.

3. J. B. E. Poussielgue

Cet inspecteur des finances a écrit un ouvrage: *Des finances de la France en* 1817 qui comporte diverses estimations globales (Revenus fonciers, revenus mobiliers, etc.), en particulier celle du total des revenus *imposables* (3,7 milliards). Ce sont ses chiffres, d'optique proprement fiscale, qui seront reproduits par Foville (dans 'La Richesse de la France', extrait du *Dictionnaire des Finances*, Paris-Nancy, 1893) et cités par Clark.

4. Passy et Goudchaux

Dans son *Traité des Impôts*, Edouard Vignes cite:

— Hippolyte Passy: en 1849, exposé des motifs du projet de loi relatif à l'impôt sur le revenu;
Revenu total imposable (foncier et mobilier) au *minimum* de 6 milliards.

— Goudchaux (ministre des Finances), projet d'impôt sur les revenus mobiliers (1848), Revenus mobiliers s'élèvent à 3 ou 4 milliards (chiffre adopté par la commission).

Ces deux chiffres ont été transmis par Foville à Clark.

5. Cochut

Dans un article de la *Revue des Deux-Mondes*, janvier 1849, A. Cochut estime les revenus mobiliers à 3.137 millions. Même en y ajoutant les revenus fonciers (comme fait Clark d'après Foville) il y manquerait encore les salaires.

6. Ballue et Peyral

Cités par Foville (*Dictionnaire de Say*, et: *France Économique*):

— Ballue (Rapport à la chambre, 26/xi/1886): 8 milliards;

— Peyral ou Peytral (projet de loi du 30/x/1888): 16 milliards; il s'agit encore ici de revenus *imposables*. Foville se contente de noter que ces chiffres sont inférieurs au revenu national.

7. Vignes

Dans son *Traité des Impôts*, après avoir cité l'ouvrage de Maurice Block (cf. infra n° 10), Vignes cherche à faire la somme des revenus

distribués pour obtenir les onze milliards de Block. Il y a vraisemblablement sous-estimation des salaires (calculés d'après le recensement de 1851 et le salaire moyen de 1858), ainsi que des traitements des employés et des professions libérales. D'ailleurs le chiffre de Block ne concerne que la production industrielle.

8. Mondenard

Le marquis de Mondenard, *Considérations sur l'organisation sociale*, 3 vol., 1802. Cite les estimations de J. Bosc pour 1789, assez peu différentes de celles de Tolosan.

9. Guilhaud de Lavergne

Économie Rurale de la France depuis 1789, Paris, 1877. L'auteur reprend les estimations de Lavoisier, Chaptal, Moreau de Jonnès, et cherche à les améliorer.

10. Maurice Block

Statistique de la France (Paris, Guillaumin, 1ère éd. 1860, 2e éd. 1875). Cet ouvrage contient (pour 1860 et pour 1872) les éléments d'une comptabilité nationale très détaillée. Il est à rapprocher des ouvrages similaires de Schnitzler et de Moreau de Jonnès. Nous avons déjà expliqué pourquoi l'usage qu'en font Leone Levi et Edouard Vignes nous paraît inacceptable.

11. N'ont pas été examinés:

— de Parieu, cité sans référence par Vignes et Foville;
— Gaudin, 1817, cité par Foville;
— Teisserenc de Bort, Assemblée Nationale, 22/XII/1871;
— Troplong, *Petits traités* (Paris, Guillaumin);
— *Dictionnaire du commerce* publié sous la direction de Guillaumin.

NOTE B

Il faut noter ici que *l'optique des évaluations* et la *nature de la documentation* ont varié au cours des autres périodes. Il semble qu'il y ait des relations certaines entre l'état de l'économie à une époque et les préoccupations et la documentation qui caractérisent cette époque.

Au XVIIIe siècle, l'agriculture constitue, de beaucoup, le secteur fondamental de l'économie. C'est de lui essentiellement que paraît dépendre tout le progrès ultérieur. Ce fait et cette croyance apparaissent dans les théories des Physiocrates. Elles influencent d'une façon décisive les évaluations.

Au milieu du XIXe siècle, la France est en train de connaître la révolution industrielle. Annoncée depuis quelques décades, elle est encore loin d'avoir pris son plein essor. On a conscience de son importance pour la production des richesses. J. B. Say, Saint-Simon, les économistes libéraux en entretiennent l'opinion. A côté d'une enquête agricole, on recensera donc soigneusement les établissements industriels de quelque importance. La tâche est jugée nécessaire; elle n'est pas encore très difficile.

Après 1880, la documentation concernant le produit national apparaît relativement plus pauvre. Sans doute, le dénombrement d'une économie plus riche, plus diversifiée, serait-il plus difficile. Les auteurs supputent surtout les revenus privés.

Il semble donc que l'optique et la documentation aient évolué, grosso modo, des produits aux revenus: du produit agricole, au début de beaucoup le principal, et qui fait la base de la prospérité, aux produits agricoles et industriels ensuite, dont on sait l'importance pour les progrès ultérieurs et dont le dénombrement reste assez aisé, aux revenus enfin, en liaison avec des problèmes de finances publiques et de répartition. C'est une autre source de différences entre les estimations. Ce n'est pas seulement la chose observée qui change, mais ceux même qui l'observent, la façon de voir des observateurs. *Les estimations et la documentation ne sont pas neutres.*

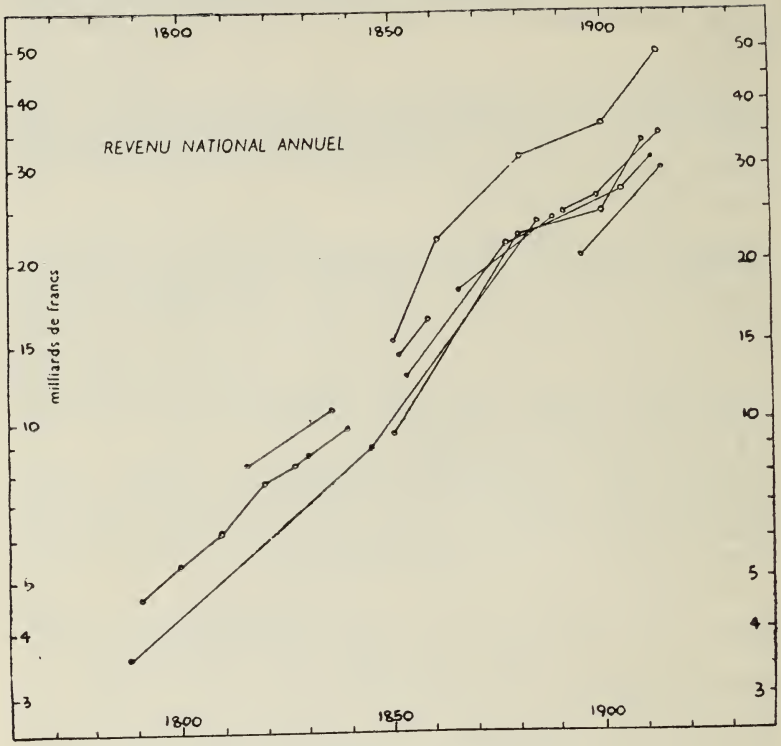

REVENU NATIONAL ANNUEL
milliards de francs
1800
1850
1900
50
40
30
20
15
10
5
4
3

Diagramme 1

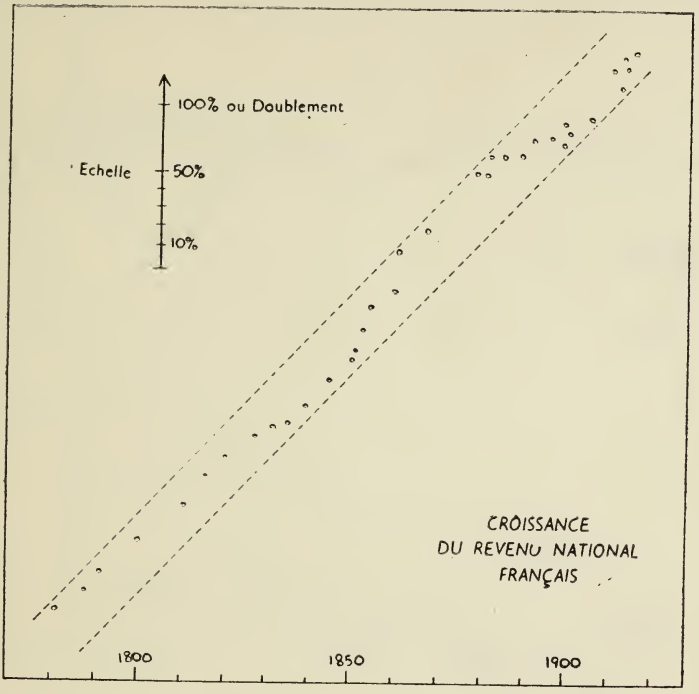

100% ou Doublement
Echelle
50%
10%
CROISSANCE
DU REVENU NATIONAL
FRANÇAIS
1800
1850
1900

Diagramme 2

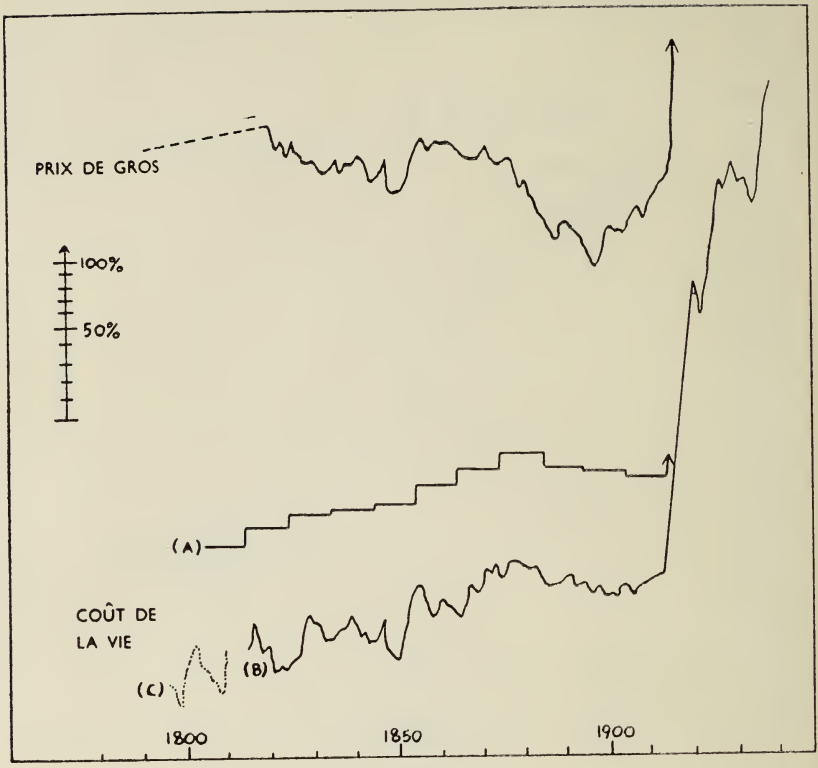


Diagramme 3

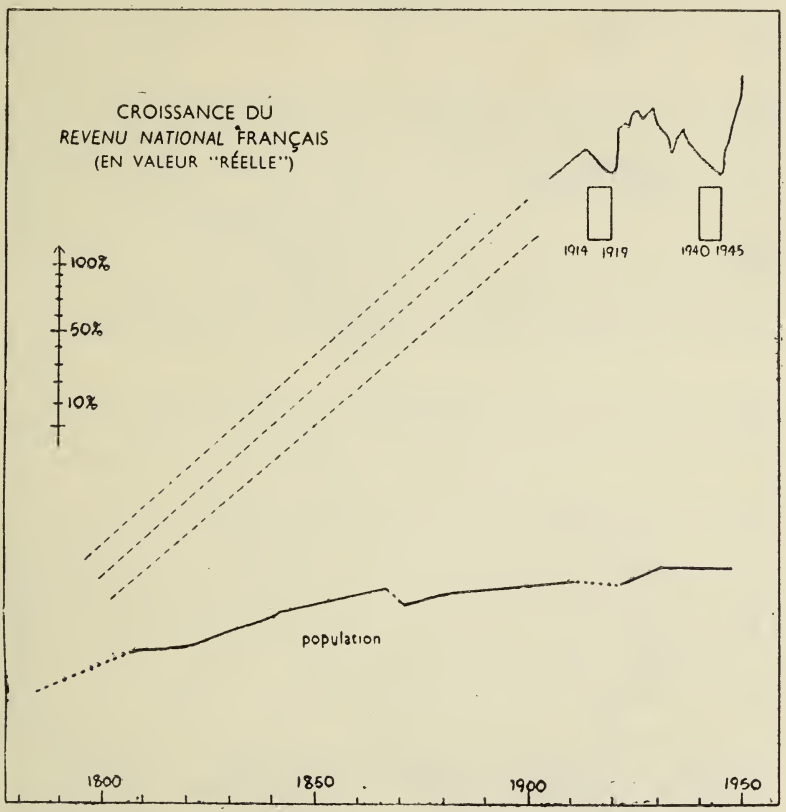
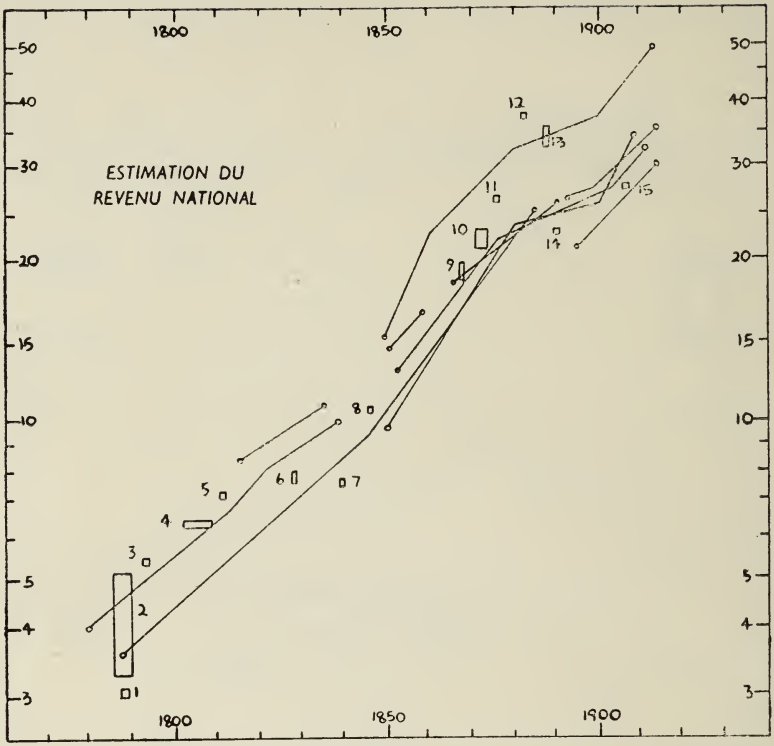

CROISSANCE DU
REVENU NATIONAL FRANÇAIS
(EN VALEUR "RÉELLE")
100%
50%
10%
1914 1919
1940 1945
population
1800
1850
1900
1950

Diagramme 4



1. Tolosan
2. Neymarck
3. Renard
4. Chaptal
5. Montalivet
6. Fourastié
7. Schnitzler
8. Chevalier
9. Ayen
10. Wolowski
11. Leroy-Beaulieu
12. Cochut
13. Neymarck
14. Coste
15. Lavergne

Diagramme 5

III. LA STRUCTURE DE L'ÉCONOMIE FRANÇAISE
à trois époques éloignées: 1788, 1845, 1885

par J. Mayer

1. *Introduction*

En partant des documents statistiques de quelques époques caractéristiques de notre histoire économique, nous voulons rassembler des données aussi précises que possible sur la structure économique de la France, et dresser une comptabilité nationale sommaire pour ces trois époques.

Nous avons choisi des époques qui satisfont à deux conditions: marquer des changements de structure économique et avoir été étudiées dans d'assez nombreux documents statistiques.

La période qui précéda immédiatement la Révolution de 1789 satisfait ces deux conditions: c'est en effet l'époque des travaux de Lavoisier, Tolosan, Delay.

Ces deux conditions se sont trouvées également réunies dans la période 1845–1848. Les évaluations connues du revenu national français marquent en effet un point de discontinuité à cette époque ainsi que des séries aussi caractéristiques que celles de la consommation de houille ou de la longueur du réseau ferré. D'autre part, la Statistique de la France entreprenait alors ses premières enquêtes, véritables recensements de la production.

La date 1885–1886 s'impose moins nettement. Du point de vue cyclique, c'est une période de reprise économique. Enfin, c'est une période de multiplication des études statistiques.

Nous ne pouvons aborder avec quelques chances de succès l'étude des documents sans nous livrer à une courte réflexion sur les vues de leurs auteurs. Structure économique, théorie des économistes et recherches des statisticiens sont des choses trop étroitement liées pour que nous puissions utiliser ces dernières sans nous préoccuper des précédentes.

Les théories prédominantes *en France* au cours du XVIII° siècle étaient celles des physiocrates. A une époque où la classe politiquement dominante, la noblesse, et l'État tiraient la plus grande part de leurs ressources des revenues fonciers et des

impôts sur les produits du sol, les économistes durent expliquer comment, seuls de tous les travailleurs, les paysans produisaient de quoi subvenir à leur propre consommation et à celle d'autres personnes. Cette structure politique était, en gros, celle de la France pré-révolutionnaire et c'est pourquoi nous ne devons pas nous étonner de voir Lavoisier imbu de l'esprit des physiocrates. Mais comme il prétend calculer, non seulement le produit net du royaume (excluant du produit brut la consommation des travailleurs) mais le produit total, il se trouve placé devant une contradiction. D'ailleurs, faute de possibilité d'enquête, Lavoisier (I) se place sous l'optique de la *consommation*. C'est de l'estimation du budget familial des diverses couches de la population qu'il tire son estimation du revenu national et il ne peut la contrôler par des estimations des productions et des consommations globales des divers produits agricoles ou autres. A la même époque, de Tolosan (II) ajoute à la valeur de la production agricole la valeur nette de la production non agricole. De tels travaux, plus conformes à l'économie de l'époque, préparent la diffusion en France de l'économie classique.

En 1845 nous nous trouvons placés devant une optique toute différente. C'est essentiellement sous l'angle de la *production* que se placent les statisticiens. L'ampleur de l'appareil administratif napoléonien, la relative simplicité de la structure industrielle et la nécessité dans laquelle se trouvait la bourgeoisie française d'accroître sa production pour lutter contre la concurrence anglaise, donnèrent naissance à de remarquables travaux statistiques. La notion de valeur ajoutée par chaque industrie aux matières premières, le partage de cette valeur entre salaire et profit sont des notions claires. Par contre, on ne se préoccupe que des productions matérielles, la plupart des services (tels que les professions libérales) ne sont pas inclus dans le produit national.

En 1885, le tableau est encore différent, et c'est l'optique *du revenu* qui prévaut. La plupart des auteurs reculent devant les difficultés d'une évaluation directe de la production et étudient les revenus distribués. En conséquence, on met tous les revenus sur le même plan et nous voyons apparaître les revenus des professions libérales et ceux des domestiques. C'est pourquoi nous voyons disparaître l'optique de la production, car l'idée moderne que produire, c'est produire de la satisfaction, ne semble pas avoir eu encore cours chez les statisticiens.

Pour essayer d'avoir des données comparables nous nous sommes attachés à ajouter, dans les deux premières évaluations, les revenus des professions libérales et ceux des employés de l'État. Quant aux revenus du commerce, il n'est pas toujours facile de savoir s'ils sont inclus ou non dans les évaluations car nous ne savons pas toujours si les prix utilisés sont des prix à la production, des prix de gros ou des prix de détail. Nous avons essayé de les séparer.

Avant de passer à l'étude des trois époques choisies, nous devons remarquer que tout ce que nous allons dire concerne essentiellement les biens ou services apparaissant sur le marché. Or, la nature de ces biens a varié d'une époque à l'autre; les scrupules des auteurs contemporains, à propos des services rendus par la ménagère à son foyer auraient eu bien plus de raisons de s'exercer il y a 150 ans. Nous ne nous intéressons qu'à la structure des transactions où intervient l'argent.

Enfin, précisons qu'il ne s'agit, dans les pages qui vont suivre, que d'une étude sommaire dont une recherche plus approfondie pourra peut-être modifier les résultats.[1] Notre conviction est que, tout au moins pour les deux dernières époques, les documents existant à Paris permettront une très bonne détermination de la structure économique de notre pays.

2. *L'Economie française en* 1788

Nos principales sources d'information ont été les ouvrages de Lavoisier (I) et de Tolosan (II); Braesch (III) nous a donné des renseignements sur les budgets, enfin nous avons trouvé chez divers auteurs des données plus qualitatives que quantitatives qui nous ont permis de préciser certains points.

Les estimations de Lavoisier et de Tolosan sont en général concordantes; là où elles diffèrent nous nous sommes servis de préférence de celles de Tolosan qui semble avoir eu à sa disposition l'appareil administratif du royaume.

a) *Agriculture.* La principale culture était celle des céréales; il s'en récoltait environ 140 millions de quintaux (le quintal pèse environ 49 Kg.) non compris les semences, mais compris les grains qui servent de matière première à l'industrie et à la nourriture des chevaux de troupe et de transports.

[1] Les recherches poursuivies à l'ISEA depuis que ces lignes ont été écrites ont justifié cette rèserve. On en trouvera un compte rendu dans *La Croissance du Revenu National Français depuis* 1870, Cahiers de l'ISEA, Série D, No. 7, 1952.

La question du prix est délicate car les différents auteurs ne sont pas d'accord sur le prix moyen des grains. Nous adopterons un sou six deniers la livre comme prix moyen sur les marchés de gros et nous ajouterons une plus value de 150 millions pour tenir compte de la fabrication du pain. Ceci nous donne une somme de 1.200 millions de livres.[1]

On trouvera tableau I la valeur des principales productions agricoles dont l'ensemble se monte à 2.300 millions de livres. Cette valeur est nette des semences mais contient les achats à l'extérieur, essentiellement à l'artisanat des campagnes. Nous la considèrerons donc comme une valeur de la production du secteur agriculture-artisanat des campagne et en déduirons 200 millions comme valeur des achats aux autres secteurs.

TABLEAU I

Production agricole, 1788

(en millions de livres)

Grain	1.200
Vins	350
Viande	350
Huiles	60
Bois[2]	150
Laine	35
Soie	25
Chanvre et Lin	50
Fourrage[3]	60
Divers	20
Total	2.300

b) *Industrie*. Le tableau II donne les valeurs ajoutées par les différentes industries, extrait de Tolosan. Nous avons adopté le classement, que nous retrouverons à l'époque suivante, selon la nature de la matière première principale.

c) *Services*. Les données sont ici moins précises. L'ensemble des loyers urbains semble se monter à 250 millions (Lavoisier). Nous évaluerons à 100 millions le revenu des professions libérales, à 200 millions les salaires payés par l'État (sur un ensemble de dépenses budgétaires, dette non comprise, de l'ordre de 300 millions) et à 400 millions le revenu net du commerce et des transports. Le revenu national brut s'établit donc comme suit:

[1] La transformation de la livre tournois en franc s'est faite à un taux très proche de la parité.

[2] Évaluation empruntée à Mirabeau (d'après Tolosan).

[3] Non compris le fourrage utilisé pour les animaux de labour et de boucherie.

Agriculture et artisanat rural	2.100	Revenu national brut: 3.600 millions de livres
Industrie et artisanat urbain	550	
Commerce et transports	400	
Loyers et professions libérales	350	
Services de l'État	200	

TABLEAU II

Valeurs ajoutées par les différentes industries

(en millions de livres)

Produits minéraux	
Sel gemme et marin (40.10c kg.)	3
Faïence, porcelaine, verrerie	7
Métallurgie (production de fonte: 69.000 t.)	35
Quincaillerie, mercerie (chiffre très hypothétique)	75
Orfèvrerie, bijouterie	3
Total	123
Produits végétaux	
Toile de chanvre, lin, coton	160
Amidon	2
Savon	5
Sucreries	5
Tabac	1
Papeterie, imprimerie	27
Total	200
Produits animaux	
Lainages	92
Soieries (étoffes)	41
Modes et tapisseries	6
Tannerie	6
Pêcheries	10
Total	155
Artisanat des villes	72
TOTAL GENERAL	550

d) *Revenu national net.* Nous n'avons pas trouvé d'évaluation de l'amortissement. Nous considérerons ce revenu comme un revenu net, et par suite, l'investissement dont nous allons parler sera un investissement net.

e) *Utilisation du revenu national.* Les chiffres que nous avons donnés ne se rapportent pas d'une façon précise à l'année 1788. Ce sont des chiffres 'd'année moyenne' pour la période précédant immédiatement la Révolution de 1789. Au cours de cette

période, la balance commerciale avec l'étranger, toujours très faible, oscillait autour de la moyenne zéro. Nous n'en tiendrons donc pas compte. Il nous reste à chercher comment ce revenu se partage entre consommation et investissement. A Paris, sur un revenu total de 300 millions, 40 étaient épargnés,[1] soit 13%.

En supposant que l'épargne était le seul fait des populations urbaines (y compris ceux qui vivaient du revenu de leurs terres) et en fixant sa valeur à 10% des revenus de ces populations, nous obtenons une valeur de 200 millions, soit environ 5% du revenu national. Nous partagerons cette quantité en deux, 100 millions étant consacrés à l'achat de biens à l'agriculture (dans laquelle s'est trouvée incluse la construction) et 100 à l'industrie. Le reste est consacré à la consommation de biens et services par les particuliers (3.000) et le gouvernement (400).

f) *Partage entre les divers facteurs de production.* Si nous retirons du revenu national les impôts indirects, il reste 3.300 millions à partager entre les facteurs de production.

Pour l'agriculture et l'artisanat rural, les données de Tolosan et Lavoisier permettent de fixer à 1.200 millions environ la part des travailleurs ruraux: ouvriers agricoles, fermiers, et métayers, petits propriétaires, artisans (c'est cette part que nous avons appelée 'salaire' dans le tableau). Le reste, soit 800 est le revenu des propriétaires.

Pour l'industrie et l'artisanat urbains, si l'on peut fixer à 100 millions la valeur des impôts indirects perçus sur leurs produits, la part des salaires est difficile à déterminer. Nous l'avons fixée à 300 millions en y incluant la rémunération du travail des petits patrons.

Pour les services, qui comprennet la location des habitations, nous avons fait la plus grande part au profit. Enfin, nous avons compté comme salaire les sommes versées par l'État aux particuliers.

Le partage du revenu national entre les différents facteurs de production se présente donc ainsi:[2]

[1] Lavoisier dit: 'La consommation des Parisiens se montant à 260 millions et leurs économies à 40 millions, leur revenu atteint 300 millions': soit $Y=C+S$.

[2] Au lieu de retrancher les impôts indirects et de partager le revenu national au coût des facteurs entre les facteurs de production usuels, nous avons, dans un but d'unité de calcul, considéré que les sommes payées à l'État en impôts indirects venaient en rémunération d'un facteur de production, que nous pourrions appeler 'activité législative' (legislatorship). Il est clair que, si nous poursuivions dans cette voie, il faudrait attribuer à ce facteur l'ensemble des impôts et aux autres facteurs les revenus individuels nets des impôts directs.

État	300 millions	soit	8%
Salaires	1.950 „	„	54%
Profits	1.350 „	„	38%

g) *Comptabilité nationale*. L'ensemble de ces résultats est présenté dans le tableau III. Il est inutile d'insister sur ce que cette comptabilité a de sommaire et d'inexact. Le précédent texte a montré quelles étaient les données tirées directement des sources de l'époque, quelles étaient celles qui résultaient d'une ventilation d'un chiffre entre plusieurs rubriques et quelles étaient celles qui étaient de simples hypothèses de notre part.

Nous avons porté les impôts directs comme étant entièrement payés par les non salariés. En fait les impôts de l'époque étaient effectivement perçus par des particuliers (fermiers généraux et autres) et reversés à l'État. Comme il est assez difficile dans les documents de l'époque de déterminer la part des sommes versées par les producteurs agricoles qui constituent des rentes, des intérêts, des profits, des impôts particuliers, survivances des droits seigneuriaux et des impôts destinés à être reversés à l'État, nous avons retiré de la valeur nette de la production agricole la consommation des cultivateurs et considéré le reste comme un profit remis aux particuliers, ces derniers acquittant ensuite l'impôt.

Comme nous avons négligé l'épargne des salariés, leur consommation est égale à leur revenu.

Sur le schéma, nous avons donné aux secteurs W et R (Salariés et Non Salariés) des surfaces proportionnelles aux nombres d'individus de ces secteurs (21 et 4). Ces valeurs sont assez hypothétiques.

Nous avons considéré le gouvernement comme un consommateur de services (fonctionnaires) produits par le secteur 'services'.

Enfin, nous n'avons pas prévu de comptes 'capital' mais nous avons distingué dans les dépenses des particuliers celles qui sont consacrées aux biens de consommation de celles qui sont consacrées aux biens d'investissement. Il en sera de même dans les autres époques.

TABLEAU III

1788 – *Comptes d'opérations*

PRODUCTION (P)

Agriculture (*A*)

Recettes			*Dépenses*			
I, S	Ventes aux producteurs	300 100	I, S	Achats	100 100
W, R, G	Vente aux consommateurs	1.400 350 50	W	Salaires	1.200
			R	Rentes et profits	800
			G	Impôts indirects	100
R	Vente de biens d'investissement	100			
		2.300			2.300

Industrie (*I*)

Recettes			*Dépenses*		
A, S	Vente aux producteurs	100 100	A, S	Achats	300 100
W, R, G	Vente aux consommateurs	250 350 50	W	Salaires	300
			R	Profits	150
			G	Impôts	100
R	Vente de biens d'investissement	100			
		950			950

Services (*S*)

Recettes			*Dépenses*		
A, I	Vente aux producteurs	100 100	A, I	Achats	100 100
W, R, G	Vente aux particuliers Vente au gouvernement	300 450 200	W	Salaires	450
			R	Profits	400
			G	Impôts	100
		1.150			1.150

Production (*P*): Agriculture, A; Industrie, I; Services, S.
Consommation (*C*): Salariés, W; Non salariés, R; Gouvernement, G.

Suite du Tableau III: 1788 – *Comptes d'opérations*

CONSOMMATION (C)

Gouvernement (G)

Recettes			*Dépenses*		
A, I, S	Impôts indirects	100, 100, 100	A, I	Achat de biens	50, 50
			S	Services	200
R	Impôts	200	R	Dette	300
R	Emprunt	100			
		600			600

Salariés (W)

Recettes			*Dépenses*		
A, I, S	Salaires	1.200, 300, 450	A, I, S	Achats de biens de consommation	1.400, 250, 300
		1.950			1.950

Non Salariés (R)

Recettes			*Dépenses*		
A, I, S	Rentes et profits	800, 150, 400	A, I, S	Achats de consommation	350, 350, 450
G	Intérêt de la dette	300	A, I	Achat d'investissement	100, 100
			G	Impôts	200
			G	Prêt	100
		1.650			1.650

Production (P): Agriculture, A; Industrie, I; Services, S.
Consommation (C): Salariés, W; Non salariés, R; Gouvernement, G.

3. *L'Economie française en* 1845

a) *Sources.* Nos principales sources d'information ont été les enquêtes de la statistique générale de la France sur la production du royaume.

Des trois enquêtes entreprises sous le règne de Louis-Philippe et destinées à déterminer la production agricole, industrielle et artisanale de la France, seule la première put être menée à

terme. La seconde, qui ne comprenait ni Paris, ni certaines régions du Sud Ouest peut-être assez facilement complétée, en particulier par la statistique de la Chambre de Commerce de Paris. Quant à la troisième, nous n'en avons trouvé nulle part le détail; quelques données globales se trouvent dans Moreau de Jonnès.

Les résultats de ces enquêtes ont été en effet analysés par Moreau de Jonnès dans deux ouvrages (IV) et divers articles de revue.

Le fait que ces diverses enquêtes ne soient pas exactement de la même epoque est une cause de difficulté. Nous avons tenté de donner des chiffres valables pour 1845 (date du début de l'enquête industrielle) en modifiant éventuellement les chiffres de l'enquête agricole lorsqu'il s'agissait de cultures ou d'élevage en régression marquée. Un moyen de contrôle nous a souvent été donné par les produits de l'agriculture servant de matière première à l'industrie dont nous trouvions une évaluation dans les deux enquêtes.

Des données partielles sur les revenus mobiliers sont fournies par Cochut (V); diverses évaluations de revenus fonciers et mobiliers sont données par Vignes (VI), Foville (VII) et divers hommes politiques à propos de projets d'imposition.

b) *Agriculture.* Les évaluations de la production agricole données par Moreau de Jonnès à partir des seules données de la Statistique Générale de la France varient de 4 à 8 milliards. Les différences proviennent des prix choisis (soit à la production, soit à divers stades du commerce) et des déductions faites pour se rapprocher d'un produit net. Un examen attentif de ces diverses données montre que la valeur de la production agricole vendue à l'extérieur du secteur agricole se monte à 5 milliards environ sur lesquels un milliard provient d'achats aux autres secteurs de production. Une décomposition de la valeur ajoutée est donnée dans le tableau IV.

Le contenu de la rubrique 'revenus des animaux' de la Statistique Générale de la France, est peu clair. Il s'agit le plus probablement de la somme de produits réemployés en agriculture (fumier, travail des animaux), vendus à l'extérieur (laine, lait) et de la plus-value provenant de l'accroissement du cheptel. Nous n'avons laissé subsister que ce que nous pensons représenter les deux derniers facteurs.

TABLEAU IV

Agriculture, 1845

Produit	Valeur ajoutée	
Froment	875	
Epeautre	7	
Méteil	114	
Seigle	235	
Maïs	64	
Orge	55	
Total céréales		1.350
Vins, eaux de vie	460	
Bières	60	
Cidre	80	
Total boissons		600
Pommes de terre	160	
Sarrasin	55	
Légumes secs	40	
Jardins	140	
Betteraves	30	
Colza	50	
Chanvre	80	
Lin	50	
Tabac	5	
Garance	10	
Mûriers	40	
Oliviers	20	
Chataigniers	10	
Autres cultures	10	
Total cultures diverses		700
Total production végétale		2.650
Revenus des animaux	490	
Animaux abattus	650	
Total production animale		1.140
Bois		210
Total productions agricoles		4.000

Nous avons fixé la valeur de l'amortissement à 250 millions, (l'ensemble des créances hypothécaires proprement dites se montait à 170 millions, ce qui représente une grande part de l'amortissement des locaux), ce qui laisse 3.750 comme produit net de l'agriculture.

Sur cette somme 200 millions sont payés en impôts indirects et 1.200 millions comme salaires d'ouvriers agricoles proprement dits (nourriture comprise); 1.300 millions constituent le revenu des propriétaires exploitants ou fermiers et le reste, soit 1.050 millions, va aux propriétaires non exploitant sous diverses formes: fermages, intérêts, etc. . . .

c) *Industrie.* Le tableau V donne la valeur ajoutée par l'industrie. Les matières premières importées ont une valeur de 450 millions sur lesquels 100 millions sont des droits de douane et 350 millions sont payés à l'étranger.

La valeur des machines fabriquées (100 millions environ) nous donne un élément pour estimer l'amortissement que nous fixons, sous toutes réserves, à 350 millions, ce qui laisse 1.750 millions de produit net.[1]

La valeur des salaires industriels se monte à 800 millions; les impôts prélevés à la production s'élèvent à 300 millions (dont 100 de droits de douane). Il reste 650 de profits divers sur lesquels 100 millions environ sont payés aux actionnaires et 550 millions représentent du bénéfice d'entrepreneur.

d) *Artisanat.* Nous sommes ici réduits à des estimations plus grossières et nous fixerons à 1.300 millions le produit net de l'artisanat, industrie du bâtiment comprise. Les salaires (y compris rémunération des petits patrons) se montent à 800 millions, les profits à 500.

Dans notre comptabilité nationale, nous avons groupé les secteurs industriel et artisanal.

e) *Commerce.* Les évaluations de Cochut sur les revenus mobiliers et les différences signalées par Moreau de Jonnès entre prix à la production et prix de détail, nous servent de guide pour cette rubrique.

En y incluant les banques, nous proposons les chiffres suivants:

	Valeur de la production		1.300 millions
dont:	Salaires d'employés	300	
	Profits	800	
	Impôts indirects	200	

[1] Dans les chiffres de la Statistique Générale, l'amortissement est inclus dans la rubrique 'Frais généraux-bénéfice'.

TABLEAU V

Industrie, 1845

Produits	Valeur ajoutée	
I. minéraux:		
Fers	190	
Houille et gaz	50	
Autres métaux et machines	130	
Terres cuites et vitres	70	
Sel	90	
Produits chimiques et autres	210	
Total		740
II. Végétaux:		
Coton	240	
Chanvre et lin	200	
Sucre	30	
Huile	10	
Alcool	8	
Savon	8	
Papier	14	
Imprimerie	10	
Autres ind.	130	
Total		650
III. Animaux:		
Laine	190	
Soie	205	
Cuirs et peaux	70	
Pêcheries	7	
Chapellerie	5	
Chandelles	3	
Autres ind.	70	
Total		560
Total industrie		1.950
Meunerie		150
Total général		2.100
—Amortissement		—350
Produit net industriel		1.750

f) *Professions libérales et fonctionnaires.* Cochut donne 350 millions comme revenu des professions libérales proprement dites. D'autre part, une analyse simplifiée des dépenses budgétaires s'établit ainsi:

Dette	400 millions
Service des Ministères	1.000 „

Dans ce dernier chiffre sont compris les frais de régie, de perception, etc. . . . Nous pensons devoir attribuer 700 millions au traitement des fonctionnaires et 300 aux achats de biens et services aux divers secteurs productifs.

g) *Revenu national.* Le revenu national net au prix de marché s'établit alors comme suit:

Agriculture	3.750	millions	de	francs
Industrie	1.750	,,	,,	,,
Artisanat	1.300	,,	,,	,,
Commerce	1.300	,,	,,	,,
Professions libérales	350	,,	,,	,,
État	700	,,	,,	,,
R.N. net	9.150	,,	,,	,,

Les divers facteurs de production y contribuent dans les proportions suivantes:

Salariés (y compris explcitants agricoles)	60%
Non salariés	32%
État (impôts indirects)	8%

h) *Utilisation du revenu national.* Sous les hypothèses suivantes:

— Les salariés épargnent 3% de leur revenu (ce qui résulte des données que nous avons sur l'épargne populaire);

— Les autres consommateurs, dont le nombre est environ le huitième de celui des salariés, consomment en moyenne 3 fois plus;

— et étant donné que l'État consomme 1.000 millions de biens et services et que la balance commerciale était excédentaire d'environ 200 millions, nous obtenons le partage suivant du revenu national:

Consommation privée	6.700	millions
Consommation publique	1.000	,,
Balance commerciale	200	,,
Investissement	1.200	,,
Total	9.150	,,

Sous ces hypothèses (peu fondées) le taux d'investissement net serait alors de 13%, le taux d'investissement brut d'environ 25%.

i) *Comptabilité nationale.* Voir tableau VI et figure 2.

j) *Remarques sur ces résultats:*

1. Nous obtenons un revenu national net au coût des facteurs (8.400 millions) plus faible que ce que l'on trouve chez beaucoup d'auteurs, particulièrement ceux de l'époque. C'est que nous avons fait un effort pour obtenir un revenu national net et éviter les doubles emplois. Nous avons considéré comme 'achats à l'extérieur' des secteurs productifs, des articles alors considérés comme achats par les particuliers. Nous avons, ce faisant, considéré comme biens intermédiaires des articles considérés alors comme biens de consommation.

2. Dans notre tableau, nous avons inclus dans la rubrique salariées (W), outre les ouvriers et journaliers agricoles, les ouvriers de l'industrie et les employés du commerce, les petits exploitants agricoles, les fonctionnaires et les membres des professions libérales. Par contre nous avons inclus dans les revenus des 'non salariés' (R) ceux des petits exploitants industriels. Nous pensons ainsi avoir des secteurs assez comparables à ceux de 1788.

3. On voit que, par rapport à 1788, les 'services' vendent proportionnellement beaucoup plus aux salariés qu'aux non salariés. C'est qu'en 1788 la plus grande partie des salariés étaient des agriculteurs, payés pour la plus grande part en nature, logement compris. Ils payaient donc peu au commerce et la plus grande part des loyers des salariés se fondait dans les 'rentes et profits' du secteur agricole. Au contraire, en 1845, la majeure partie des salariés est composée de travailleurs libres, recevant leur salaire en argent, payant des loyers et participant à la création des bénéfices commerciaux. Nous assistons donc à un transfert de revenu des 'profits de l'agriculture' vers les 'profits des services'.

4. Une part de la croissance apparente du secteur industriel vient du transfert sur ce secteur de l'artisanat rural et de la construction rurale. Cependant la croissance de la proportion du revenu national provenant de l'industrie est manifeste. A l'intérieur du secteur industriel nous voyons que la part des industries dont la matière première est minérale a fortement augmenté.

5. Le rapport salaires sur profits semble avoir fortement augmenté dans le secteur agricole, fortement diminué dans le secteur industriel.

TABLEAU VI

1845 – *Comptes d'opérations*

PRODUCTION (C)

Agriculture (*A*)

Recettes			*Dépenses*			
I, S	Vente aux producteurs	800 250	I, S	Achats	1.000 150
W, R, G	Vente aux consommateurs	3.000 650 100	W	Salaires	2.500
			R	Profits	1.050
			G	Impôts indirects	200
E		100			
		4.900			4.900

Industrie (*I*)

Recettes			*Dépenses*		
A, S	Vente aux producteurs	1.000 350	A, S, E	Achats	800 200 350
W, R, G	Vente aux consommateurs	800 650 100	W	Salaire	1.600
			R	Profits	1.150
E		300	G	Impôts	300
W, R	Vente de biens d'investissement	150 1.050			
		4.400			4.400

Services (*S*)

Recettes			*Dépenses*		
A, I	Vente aux producteurs	150 200	A, I	Achats	250 350
W, R, G	Vente aux consommateurs	1.200 450 800	W	Salaires	1.350
			R	Profits	800
			G	Impôts indirects	200
E		150			
		2.950			2.950

Production (*P*): Agriculture, A; Industrie, I; Services, S.
Consommation (*C*): Salariés, W; Non salariés, R; Gouvernement, G; Étranger, E.

Suite du Tableau VI: Comptes d'Opérations, 1845

CONSOMMATION (C)

Gouvernement (G)

Recettes			*Dépenses*		
I, A, S	Impôts indirects	300 200 200	A, I, S	Achats	100 100 100
W, R	Impôts directs	300 300	S	Services (fonct.)	700
R	Emprunt	100	R	Intérêts de dette	400
		1.400			1.400

Salariés (W)

Recettes			*Dépenses*		
A, I, S	Salaires	2.500 1.600 1.350	A, I, S	Consommation	3.000 800 1.200
			G	Impôts	300
			I	Invest.	150
		5.450			5.450

Non Salariés (R)

Recettes			*Dépenses*		
A, I, S	Profits	1.050 1.150 800	A, I, S	Consommation	650 650 450
G	Intérêts	400	G	Impôts	300
			G	Prêt	100
			I	Invest.	1.050
			E	Balance	200
		3.400			3.400

Etranger (E)

Recettes			*Dépenses*		
I	Vente de matières Ières	350	A, I, S	Achats	300 100 150
R	Balance	200			
		550			550

4. *L'Economie française en* 1885

a) *Sources.* En dehors de données sur la population, les publications de la Statistique Générale de la France ne donnent pas de renseignements complets sur la production. Aussi nous sommes-nous servi principalement des nombreuses études faites à cette époque sur les revenus distribués, en particulier celles de Costes (VIII), Neymark (IX), de Foville (X), et Lavergne et Henry (XI) (cette dernière pour une époque plus tardive).

Nous pensons cependant qu'avec les données de la Statistique Générale de la France et celles de certains auteurs, il serait possible d'avoir une vérification en calculant le revenu national sous l'optique du produit. Seul le manque de temps nous a empêché de le faire.

Les différents auteurs divisent généralement les revenus en revenus du travail, revenus du capital et revenus mixtes. Cependant, il est clair que, particulièrement pour l'agriculture et le commerce, cette division n'est pas faite suivant les mêmes critères chez les uns et chez les autres. Nous n'avons conservé que deux catégories en nous basant sur le même principe que pour l'époque précédente.

Les résultats sont rassemblés dans le tableau VII. Si nous les discutons moins que pour les époques précédentes, ce n'est pas qu'ils nous paraissent meilleurs. C'est d'une part, qu'ils se présentent directement sous la forme que nous utilisons, et, d'autre part, par manque de temps.

Dans ce tableau:

— nous avons ignoré les transactions intérieures aux trois parties du secteur productif (Agriculture, Industrie, Services), faute de données;

— nous avons imputé aux particuliers, et non aux entreprises toutes les décisions concernant l'épargne et l'investissement;

— nous donnons une répartition des dépenses de consommation des salariés et des non salariés entre les diverses consommations. Cette répartition est très arbitraire. Nous n'en tiendrons pas compte dans nos conclusions;

— nous avons distingué des transferts les transactions qui sont des payements de produits ou rémunérations de facteurs.

b) *Revenu national net aux prix de marché.* Le revenu national est ainsi constitué:

Agriculture	8.500	millions	de	francs
Industrie	8.000	„	„	„
Commerce	4.500	„	„	„
Professions libérales	2.000	„	„	„
État	1.300	„	„	„
R.N. net	24.300	„	„	„

Notons que nous avons inclus dans le secteur 'professions libérales' le salaire des domestiques. Nous n'en avions pas tenu compte dans nos autres évaluations, car il était alors considéré comme un transfert et nous n'en avions aucune évaluation. Quand nous ferons des comparaisons entre ces trois époques, nous supprimerons ce revenu (1.400).

c) *Utilisation du revenu national.* Grâce aux travaux de Neymark nous avons des données assez précises sur l'épargne. Pendant la période 1880-1890, l'ensemble des émissions françaises s'est monté en moyenne à 1.300 millions par an. Comme l'État émettait environ 300 millions d'emprunts par an, reste 1.000 millions pour les émissions privées. En supposant que les entreprises ne faisant pas appel au public investissaient une somme à peu près égale, nous avons fixé à 1.900 millions le montant de l'épargne privée. Nous n'avons pas tenu compte des caisses d'épargne qui investissent en général leurs fonds en emprunts d'État déjà comptés.

Faute de données précises sur l'utilisation des emprunts d'État, nous les avons considérés comme des transferts.

Pendant cette période, le portefeuille français en valeurs étrangères s'accroissait en moyenne de 500 millions par an. Le revenu des valeurs étrangères appartenant à des Français et payé en France était de 1.200 millions par an. La balance commerciale étant en déficit de 1.000 millions, nous avons balancé le compte 'Étranger' par un terme 'placements étrangers en France' de 300 millions. Nous n'avons pas, faute de données, tenu compte de la part du revenu national français allant à l'étranger par suite de tels placements antérieurs. C'est là un des défauts de logique du tableau présenté.

Ceci étant, le revenu national est partagé de la manière suivante:

Consommation privée	21.300	millions	de	francs
Consommation publique	2.100	,,	,,	,,
Investissement	1.900	,,	,,	,,
	25.300	,,	,,	,,
Moins balance commerciale	1.000	,,	,,	,,
	24.300	,,	,,	,,

d) *Contribution des différents facteurs de production.* Sous les réserves déjà indiquées sur le partage des individus entre les diverses catégories, les facteurs de production concourent à la formation du revenu national dans les proportions suivantes:

Salariés	59%
Non salariés	33%
État	8%

TABLEAU VII

Comptabilité nationale, 1885

PRODUCTION

Agriculture (*A*)

Recettes					*Dépenses*
W	Ventes aux consommateurs	6.300	W	Salaires	5.000
R		2.000	R	Profits	3.000
G		200	G	Impôts indirects	500
		8.500			8.500

Industrie (*I*)

Recettes					*Dépenses*
W	Vente aux consommateurs	3.900	W	Salaires	5.000
R		2.400	R	Profits	2.500
G		500	G	Impôts indirects	500
M	Biens d'investissement	2.000	E	Achats à l'étranger	800
		8.800			8.800

Suite du Tableau VII: Comptabilité nationale, 1885

Services (S)

Recettes					*Dépenses*
W	Vente aux consommateurs (fonction.)	3.500	W	Salaires	4.300
R		2.700	R	Profits	2.500
G		100	G	Impôts indirects	1.000
G		1.300			
M	Vente aux investis.	200			
		7.800			7.800

CONSOMMATION (C)

Gouvernement (G)

Recettes					*Dépenses*
A	Impôts indirects	500	A	Achats	200
I		500	I		500
S		1.000	S		100
W	Impôts directs	300	S	(Fonct.)	1.300
R		500	W	Intérêt de la dette	300
W	Emprunt	100	R		1.000
R		200			
W	Vente aux consommateurs	200			
R		100			
		3.400			3.400

Salariés (W)

Recettes					*Dépenses*
A	Salaires	5.000	G	Achats de produits de consommation	200
I		5.000	A		6.300
S		4.300	I		3.900
G	Intérêts de la dette	300	S		3.500
			E		100
			G	Impôts	300
			G	Prêt	100
			M	Invest.	200
		14.600			14.600

Non Salariés (R)

Recettes					*Dépenses*
A	Profits	3.000	A	Achats de produits de consommation	2.000
I		2.500	I		2.400
S		2.500	S		2.700
G	Intérêt de la dette	1.000	G		100
E	Revenu de portefeuille	1.200	E		100
			G	Impôts	500
			G	Prêts	200
			M	Invest.	1.700
			E	Placement	500
		10.200			10.200

Suit du Tableau VII: Comptabilité nationale, 1885

Investissements (*M*)

Recettes				*Dépenses*	
W, R	Epargne	200 + 1.700	I, S	Investissements	2.000 + 200
E	Placements de l'étranger	300			
		2.200			2.200

Etranger (*E*)

Recettes				*Dépenses*	
I, W, R	Ventes de produits	800 + 100 + 100	R	Revenu du portefeuille fr. à l'étran.	1.200
R	Placements des fr. à l'étran.	500	M	Placements étran. en F.	300
		1.500			1.500

5. *Conclusions*

1) *Variations* dans la composition du revenu national:

	1788	1845	1885
	%	%	%
Agriculture	58	41	37
Industrie	15	33	35
Commerce et services	18	14	19
Professions libérales	3	4	3
État	6	8	6

Nous voyons donc une augmentation du secteur industriel et une diminution du secteur agricole, mouvements accentués de 1788 à 1845 par le passage dans nos évaluations de certaines activités du secteur agricole au secteur industriel.

Quant aux autres secteurs, je ne pense pas que nous puissions tirer de conclusions des variations enregistrées.

2) *Participation* des différents facteurs de productions:

	1788	1845	1885
	%	%	%
Salariés	54	60	59
Non salariés	38	32	33
État	8	8	8

Nous voyons donc une remarquable stabilité de la part des impôts indirects dans le revenu national et une croissance marquée de la part des 'salariés' de 1788 à 1845. Notons que les deux catégories 'salariés' et 'non salariés' sont des catégories comptables. Nous avons essayé d'assurer la continuité de la division, ce qui n'exclut nullement une évolution interne de nature sociologique. C'est ainsi que la catégorie 'salarié' comprend, aux diverses époques, des groupes sociaux aussi différents dans leur nature et leur évolution que le prolétariat industriel et les propriétaires agricoles exploitant.

3) *Utilisation* du revenu national:

	1788	1845	1885
	%	%	%
Consommation privée	83	74	87
Consommation publique	11	11	9
Investissement	6	13	8
Balance commerciale	0	2	4

4) *Composition* de la production industrielle:

	1788	1845	1885
	%	%	%
Prod. d'origine minérale	26	38	—
Prod. d'origine végétale	42	33	—
Prod. d'origine animale	32	29	—

5) *Remarques générales:*

Comme nous l'avons prévu, nos plus grandes difficultés au cours de cet essai d'établissement de comptabilités nationales sont venues des différences d'optique des auteurs des diverses époques, qui se traduisent par un contenu différent des notions mêmes de production et de revenu national. Un grand nombre de transactions sont passées de 1788 à 1885 de la catégorie 'transferts' dans la catégorie 'rémunération de facteurs de production'. Il nous semble même que, par rapport à 1885, la tendance contemporaine soit un retour en arrière et que nous considérions aujourd'hui comme transferts des transactions que les auteurs de la fin du 19ème siècle auraient classées comme

rémunérations, particulièrement dans le secteur de l'État. Il est vrai que, aujourd'hui comme alors, les justifications théoriques pour ce faire sont faibles.

Si nous avons vu une croissance de la part du secteur industriel aux dépens de la part du secteur agricole, le bouleversement complet des formes de production qui s'est produit au cours de l'époque étudiée n'apparaît pas dans les chiffres que nous venons de donner. C'est qu'en gros, les rapports *entre les individus* qu'expriment essentiellement les transactions étudiées sont restées comparables. La division des revenus en revenus provenant du travail et revenus provenant de la possession des moyens de production est valable de la suppression de l'esclavage à nos jours. Il faut aller dans le détail pour voir des variations nettes: c'est ainsi que le rapport salaire sur profit, dans le secteur industriel, est passé de 2 en 1788 à 1,4 en 1845 pour remonter à 2 en 1885, variations probablement liées à la naissance du prolétariat industriel dans la première phase et au renforcement de sa puissance et de ses moyens d'action dans la seconde.

Si nous nous posons maintenant la question – en fait préalable à l'étude des conclusions – de la confiance à accorder aux chiffres avancés, nous répondrons que nous n'avons pas pu, dans cette première ébauche, faire d'étude suffisamment poussée de la précision des observations pour pouvoir en tenir compte. Mais nous pensons que, dans une étape ultérieure, une telle étude est possible et que nous pourrons savoir quels sont ceux de nos résultats qui peuvent être significatifs. Il en serait de même pensons-nous, pour n'importe quelle période de 1830 à nos jours.

Mais nous pensons qu'une telle étude doit être précédée d'une étude qualitative extrêmement poussée des formes de production et des rapports entre les individus dans leur activité de producteurs. *Ce sont en effet ces rapports qu'expriment le cadre de notre comptabilité nationale* et les rubriques que nous y incluons; l'étude des chiffres permet de remplir les colonnes de chacun de nos comptes mais ne permet pas de fixer les noms de chaque compte et de chaque rubrique.

ANNEXE

POPULATION

1. *Population urbaine et rurale*

	1788	1845	1885
(en millions d'habitants)			
Urbaine	8	8,6	13,1
Rurale	17	26,7	24,3
Total	25	35,3	37,4
(en pourcentages)			
Urbaine	32	24,5	35
Rurale	68	75,5	65

Les chiffres de 1788 sont donnés sous toutes réserves par Lavoisier. Les autres résultent des recensements quinquennaux.

2. *Population par source de revenus*

Nombre de personnes tirant leur subsistance des différents secteurs de la production.

	1788	1845	1885
(en pourcentage)			
Agriculture	75	62	49
Industrie	10	18	25
Commerce et services	8	6	12
Professions libérales	5	5	6
Autres	2	9	8

Ces données, particulièrement celles de 1788, sont peu sûres et demandent à être revues et précisées.

3. *Population ouvrière*

Proportion de la population totale vivant d'un travail salarié dans les manufactures et usines. Les salariés agricoles et ceux de l'artisanat sont exclus ainsi que les employés de commerce.

	1788	1845	1885
(en pourcentages)	2	4,5	15

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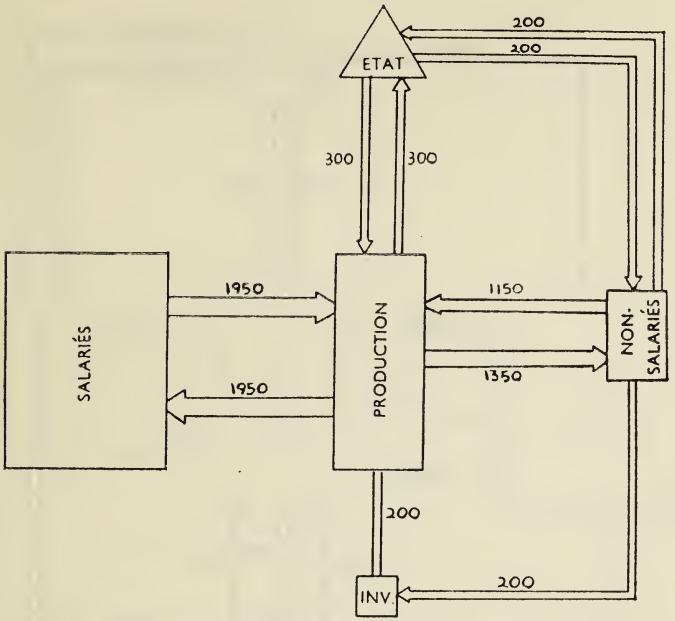

Diagramme A. La Structure de L'Economie en 1788

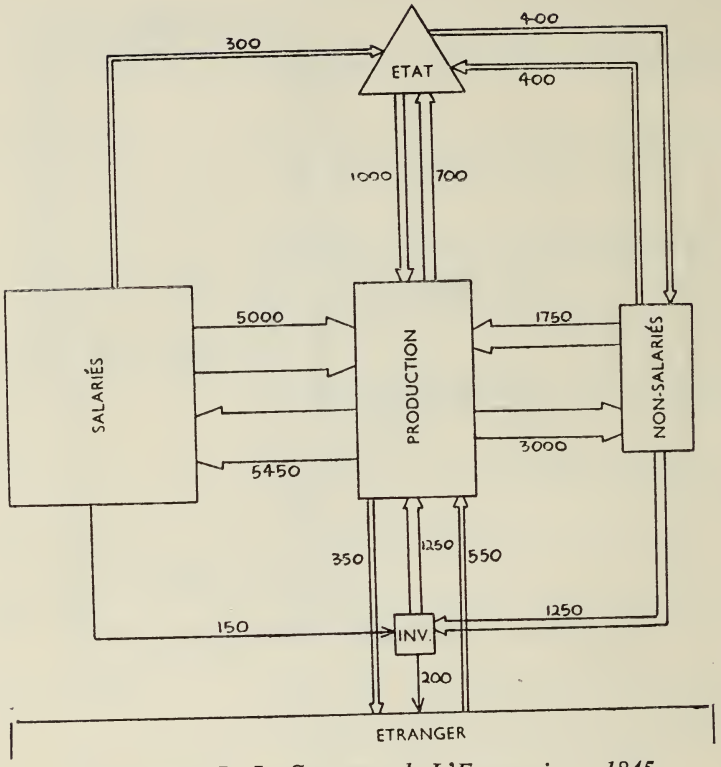

Diagramme B. La Structure de L'Economie en 1845

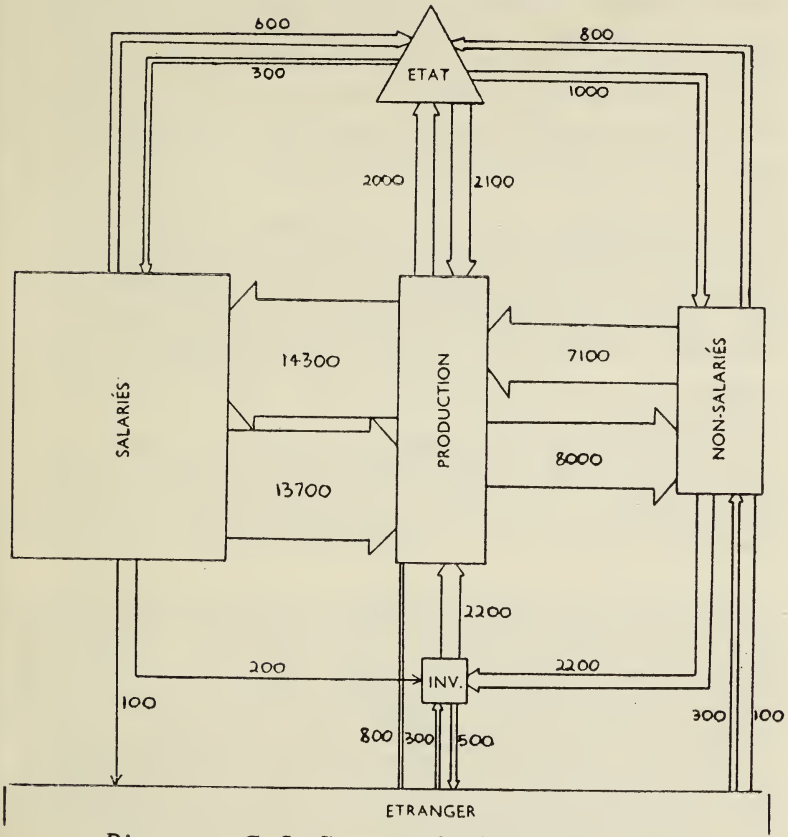

Diagramme C. La Structure de L'Economie en 1885

THE NATIONAL INCOME OF FRANCE SINCE 1780

1. This report is a collective work, prepared under the direction of François Perroux by Georges Guilbaud and Jacques Mayer, with the assistance of Jean Albert and Marcel Malissen. All members of the team wish to emphasize as definitely as possible that, in their opinion, the history of an economic growth cannot be told by the fluctuations of a single magnitude (whether it be national product or income; average product or income per capita; or any single index), but must be described as the changing pattern of the set of figures which constitutes the national accounts. In a few words, it is not merely a matter of aggregate quantities, but mainly a matter of economic structure, and the most important problem in such a topic is to make clear *how* something which we call growth has occurred, at what cost – or at the expense of whom – and to what profit – or to the profit of whom.

Nevertheless, aggregate estimates are useful as an introduction to the problem. They are dealt with in the first part of our report. The second part is devoted to a draft of national accounts at three distant periods and, as far as possible, to their comparison.

2. It is often said that the statistical data on national income since the end of the eighteenth century are very abundant in France. That is true: we used more than fifty estimates of national income for the nineteenth century alone, selected amongst an even greater number. These estimates are fairly regularly scattered over the period, and their thorough examination shows that it should be possible to draw, out of them and of the computations they are made of, national accounts for a satisfactory number of periods.

But one has to be careful when reading most of the *lists* of aggregate data published up to now: the too frequent lack of comments prevents one from giving any significance to the figures so gathered, for all of them do not correspond to the same quantity. Moreover, some authors (including Mr. Colin Clark), who could not get to the primary sources, have contented themselves with secondary information without noticing that they were quoting twice, if not more often, the same estimates slightly altered or not even altered at all by the

successive statisticians, economists or politicians who had made use of them.

Our effort of selection has not always been to get rid of estimates which were not likely to result from an accurate calculation (it may be useful to compare a rough opinion with a thorough computation). It has been:

(i) To put aside the estimates which, though precise, reliable and certainly useful for a later stage of our study, are not complete, that is to say cannot pretend to express any one of the usual totals admittedly representing a national income;

(ii) To discover the exact origin of the complete estimates we have come across and to eliminate the redundant ones;

(iii) To make clear, as far as possible, the character of each of these genuine estimates, as well as the character of the men who produced them;

(iv) To divide our set of estimates into two parts: on the one hand, those which belong to series established by one person and are therefore likely, within any given series, to represent the same quantity; on the other hand, all the isolated computations.

3. The paper deals first with the *series*: there are 35 estimates in 10 series. They are plotted on a chart in semi-logarithmic co-ordinates. They differ in magnitude, of course, for any given period, but it is remarkable that all the lines linking the points of a given series are fairly parallel, which means that the relationship between the different significant totals is roughly one of proportionality over time. Thus, it becomes possible, if we seek merely a typical rate of growth, to re-group the 35 estimates by translation to a common starting-point. It appears, then, that the rate of growth is about 1.8 per cent per year, which means 20 per cent every 10 years and 100 per cent in 39 years.

Was this rate steady or fluctuating? The line which most closely fits the 35 points is slightly fluctuating in accordance with the kondratief cycles, but that does not allow to conclude in favour of anything because its waves are entirely within the margin of error which can reasonably be expected (15 per cent more or less).

4. So far, monetary values only were taken into account. That

is of minor importance, owing to the monetary stability which prevailed throughout the nineteenth century and even until 1914. If, however, we apply a price index to the previous figures, we find a slightly smaller rate of growth.

After 1914 it is obviously necessary to correct for the ample variations of prices which have occurred since then. It seems that the rhythm of the growth has considerably changed during this later period.

As for the growth of population, it has been very slow for the last 150 years, so that the relationship between economic and demographic growths is hardly apparent.

If it is not very surprising that the regularity of growth of the French national income, between 1780 and 1914, was roughly independent of the monetary and demographic conditions, which did not change much, it is more striking that, at least on the scale of our computations, it does not seem to have been altered by the political and social background, which was changeable, as everyone knows.

5. We now introduce the isolated estimates. The dispersion does not increase much. If, therefore, we wanted to express only the fact of the growth and to estimate a mean rate, the accuracy given by our sources would be quite sufficient. But if the point is, as we believe, to interpret the phenomenon, then the main difficulty arises from the precision required in statistical estimations: the most significant phenomena occur within a margin which, at present, is included within the margin of general uncertainty.

6. Let us pass to the draft of national accounts for three one-year periods dated approximately 1788, 1845, 1885. In the first period the physiocratic theories were still holding very fast and the statistical apparatus was not well organized. In the second one, industrial production was in the limelight, French administration was efficient, and the Statistique Générale de la France, which had been set up for fifteen years or so, was working well. In the third period the current economic thought had changed, as well as the political and social background, and the structure of industrial production had become more and more complicated.

As a result, it happens that the national income is mainly considered from the point of view of consumption in the first

period, from the point of view of production in the second, and from the point of view of earnings in the third.

7. On that ground the three sets of national accounts are presented as follows:

(i) The aggregate national product for 1788 and for 1845 and the aggregate national income for 1885. An attempt at breaking down these aggregate quantities into sectors of production has been made, very successfully for 1845, satisfactorily for 1788, but rather unsuccessfully for 1885, since, for this last period, the net national income at market prices could not be broken down into more than five groups (agriculture, industry, trade, professional incomes, government).

(ii) An estimate of the respective shares of consumption and investment, and a tentative allocation of consumption to agriculture, industry, services.

(iii) A tentative distribution of the national income in three broad categories: government revenue, wages, profits.

(iv) Drafts of national accounts, showing receipts and outlays on the production and on the consumption sides, the sectors of production being agriculture, industry, services, the sectors of consumption being government, wage earners, non-wage earners, and the item being the particular sorts of flows linking each group of producers to each group of consumers. For 1845 and 1885 an account has been introduced for foreign trade, which is neglected in 1788, when it was very small and its balance averaged zero.

Subject to qualifications which are expressed in the report, the following sets of figures are also given, in percentages for each of the three selected periods:

— structure of the net national product (agriculture, industry, trade and related services, professional services, government);

— structure of the next national income (wages, other personal income, government);

— structure of the national expenditure (private consumption, public consumption, net investment, balance of external trade).

For 1788 and 1845 the structure of industrial production (from mineral, vegetable and animal raw materials) is also given.

8. The outstanding conclusions of this reconstitution of past accounts may be stated as follows:

(i) The comparison between the accounts at the three distant periods considered is rendered somewhat awkward, owing to the different approaches utilized, and, consequently, to the very content of the concepts of national income and national product;

(ii) Many transactions, quoted as transfers in the last years of the eighteenth century, came more and more to be computed as earnings during the nineteenth; it seems that this tendency culminated towards the end of the nineteenth century and has been ebbing in contemporary thought;

(iii) The three series of computations show, of course, the growth of industry relatively to agriculture, but do not reveal the complete change in the economic and social structure which has occurred during the last 150 years;

(iv) Any serious study of economic growth, if one wants it to be made in terms of reliable accounts, must be based upon a very thorough preliminary study of the forms of production and of productive relations successively involved.

4

INTER-COUNTRY COMPARISONS OF THE NATIONAL ACCOUNTS AND THE WORK OF THE NATIONAL ACCOUNTS RESEARCH UNIT OF THE ORGANIZATION FOR EUROPEAN ECONOMIC CO-OPERATION

by Richard Stone and Kurt Hansen

I. INTRODUCTION

THE point of departure for this paper is the practical need to compare the economic structure and performance of different countries. Such comparisons are involved in almost any international economic co-operation. When an international organization is established the question of financial contributions arises and it is usually decided that rich countries should contribute more than poor ones. If aid is to be allocated, some rules are needed as a basis and these rules are likely to take account of needs. The continuation of such grants must bear some relationship to performance and the contributions of different countries to a common effort must depend in some sense on ability to pay. In addition to these practical administrative needs there is the further fact that partners in a common enterprise will wish to be kept informed of one another's situation and progress, for in this way dangerous situations and costly mistakes may be avoided. Just as a private business of any size requires the services of an accountant, not to take the decisions but to see that certain essential information is at the disposal of those who do, so a national government or an international organization must, if it is to formulate and operate economic policies, have corresponding information at the national or international level.

But what is meant by riches, needs, performances, ability to pay, situation and progress, and how are they to be measured and compared? These indeed are hard questions which have only in part been answered and then only in a provisional way. Some comparisons are easier to make than others and are less subject to arbitrariness on the one hand or vagueness on the other.

Some of these questions require more information than do others, and in most cases approximate answers and comparatively crude methods can be made to serve until a better approach is practicable. Some questions are difficult to answer

because it is hard to formulate a suitable set of concepts. In other cases concepts which appear to be suitable can be formulated but it turns out to be difficult to specify their empirical correlates. In yet other cases the empirical correlates can be specified, but the data needed to construct them are only in part available or are lacking altogether.

Since some questions are more difficult to answer than others, and since the level of sophistication of the answer may vary greatly, it seems best to approach this whole subject by working step by step from the known to the unknown. Experience shows that it is possible to draw up for a single country a set of concepts for describing the economy of that country in terms of transactions and also that it is possible to specify and measure the empirical correlates of these concepts in a way and to a degree of accuracy that makes them useful for purposes of economic policy. From a comparative point of view the problem here is not that the task cannot be completed but that it is completed in different countries in different ways. The approach therefore must be to remove these differences by relating the estimates of the different countries to a given standard system and by adjusting the countries' own estimates so as to conform as closely as possible to this standard. The standard may be specified either in broad outline or in considerable detail.

An attempt is made in this paper to set out some of the problems to be faced in comparing the national accounts of different countries, and a brief account is given of the work of the National Accounts Research Unit of the Organization for European Economic Co-operation. It is assumed in the approach adopted here that many useful comparisons can be made without attempting to say whether one country is better off than another. The assessment of economic welfare would require a knowledge of the relative amount of final goods and services of all kinds available in two countries, a type of information which represents the most that is sought in the approach adopted here. But it would also require a knowledge of many other things. Among these is a common basis of valuation to be employed in the comparison. This common basis raises two difficulties; first, that the commodities consumed in any two countries are not identical in character and quality, and second, that the scale of relative values as reflected by prices is likely to be different in any two countries. Thus an international com-

parison of real income which is not simply based on converting money figures by means of the rate of exchange must essentially be based, even with perfect data, on a group of final commodities common to both countries, and the valuation employed is unlikely to be equally appropriate in both countries. But even if these difficulties prove unimportant or can be overcome there remain others to be considered before welfare comparisons can be made. Thus differences of situation due to say climatic differences may greatly alter human needs, so that a different amount of certain commodities may be needed by a given individual for him to feel the same amount of well-being in different situations. Again, the organization of society in two countries may be so different that a definition of final goods which seems satisfactory in either country, taken singly, may not be equally acceptable when the two countries are being compared. Furthermore, comparisons of welfare require that some account be taken of the effort required to produce a given output and of the distribution of rewards that accompanies a given system of production.

If the problem of comparison is tackled from the other end it is possible to distinguish several stages each of which, when attained, will permit certain questions to be answered. The first stage is to draw up a standard accounting system for the main aggregates. If this can be done for a number of countries then a great deal is already possible. Even if for statistical reasons there are still a number of items in the accounts for different countries which cannot properly be compared, it will still be possible to make similar analyses for the different countries separately where these are not highly dependent on the precise definitions used. This will frequently be the case, particularly in analyses involving year-to-year changes, and in this way comparative analyses of inflationary gaps, for example, and their contributing causes may be possible. If the statistical content of the transactions for different countries can be made more nearly uniform, it will also be possible to carry out a number of comparisons involving ratios such as the proportion of total product devoted to asset formation or the proportion of total saving supplied by public authorities. The second stage is to attempt a more detailed classification on uniform lines of the main aggregates in the standard accounts. This stage permits a more detailed comparison of economic structure to be made,

such as an allocation of total product to the various industries in which it is generated or an allocation of total asset formation to the various industries in which it is taking place or to the various products in which it is embodied. If this stage can be reached the percentages derived from the first stage will be much more useful, since in fact they do not tell a great deal unless they can be subdivided in some detail. Furthermore, much valuable information will be provided for econometric model building since simple transaction models, of which the Leontief model and foreign trade matrix models are examples, employ only information on money transactions expressed in current prices. The third stage is to construct price and quantity indices for each of the different countries, so that the movement over time of the various aggregates can in each case be expressed in terms of constant prices. When this is done it is possible to make certain comparative statements about the real growth of the different economies and their component parts. The fourth and last stage considered here is to attempt to reduce the money estimates for the different countries to a common currency unit. This step involves great conceptual and practical difficulties but, if achieved, permits a closer comparison of the relative magnitude of different economies and their components.

It is important to realize that these steps are worth taking even if the conceptual problems encountered cannot always be resolved without conventions and that the main obstacle to useful results is the lack of relevant statistical material of sufficient reliability. The analogy with the private accountant holds here. His task is to provide factual material which is relevant for business decisions. The directors and managers who make use of these facts in their work do not specify in minute detail how every item in an accounting statement is to be defined and measured. They recognize that accountants have to base their work on certain principles and conventions. They may however reasonably expect a warning if, under changed conditions, measures based on certain principles fail to reflect the underlying situation as reliably as in the past. This may happen if, for example, conventions based on the assumption of a stable price level which, at one time may have been reasonable, are applied under conditions of great secular movements of prices, a problem which is being faced at the present time in connection with the valuation of provisions for depreciation.

The economic statistician may regard his task in much the same light. He can improve the suitability of his concepts and data and gradually extend the range of questions that can be answered reliably, undeterred by the fact that there are many questions which at present he cannot answer and some which perhaps he will never be able to resolve. Provided that he understands the theory of his subject and the assumptions and conventions with which he is working, he is likely to do more in the long run on the question of welfare comparisons than those who begin and end their work at the purely theoretical level.

The arrangement of the remainder of this paper is as follows. Section II is concerned with the concepts employed in national accounting and their translation into empirical correlates, that is, into objects which are capable of measurement and for which the procedures required for measurement can be written down. Section III takes up the second stage in the process of measurement, namely the translation of the empirical correlates into actual estimates. The main feature here is the important influence which the statistical sources actually available have on the measurements that can be made in practice and the differences that arise from reliance in different countries on different sources of data. On the basis of these two sections an attempt is made in Section IV to sketch out the main features of a good system of accounts intended to meet the needs of international as well as purely domestic analysis. Section V contains some brief remarks on the information needed for comparisons in real terms over time within a single country, and Section VI contains some even briefer remarks on the problem of comparisons in real terms between countries. Finally in Section VII a description is given of the work of the National Accounts Research Unit of the Organization for European Economic Co-operation in furthering the comparability of the national accounts statistics of the participating countries.

II. CONCEPTS AND EMPIRICAL CORRELATES

The first point to be made is that there is an almost unending number of purposes for which national accounts information is used with the consequence that the concepts adopted should be framed with the object of providing useful building blocks which can be rearranged for different purposes. Thus, in defining fixed asset formation, it seems desirable to adopt the common busi-

ness practice of charging maintenance and repair, except in special cases, directly against revenue from current operations, and of defining the capital expenditure to be charged on the resting account in a comparatively narrow way so as to include only new pieces of equipment and major alterations to existing equipment. It may be objected that from the viewpoint of investment planning this treatment of asset formation is too narrow, because it is necessary to consider requirements for maintenance and repair as well as for new equipment since similar materials and industries are involved in each. There is no doubt some truth in this, but the conclusion does not follow that for investment programming all that is needed is information on asset formation defined in as gross a way as possible. For with such information no distinction is made between the inputs needed to maintain existing capacity and those to be used to extend capacity, with the consequence that with gross figures a given percentage cut in allocations may have very different effects on different industries. If, for technical reasons, it is necessary to consider repair and maintenance expenditure along with new additions to wealth, then the building blocks should contain estimates of these expenditures and they should not be lost in the general category of operating expenses.

In the second place it is possible to imagine various systems of accounts drawn up from different points of view. Thus an attempt might be made to keep the accounts in a way which reflected as closely as possible, subject to some rearrangement of the items, the actual accounts kept by the different transactors. In practice this plan could never be strictly carried out since many transactors, notably households, do not keep accounts at all, and it would be necessary either to compile an aggregate account for them from official statistics or to impose a uniform accounting system on them by means of a family budget inquiry. There would also be difficulties due to the fact that different transactors would almost certainly record their external transactions in different ways, though it may be doubted whether in practice such difficulties would be very serious. The main problems, and this indeed would be the principal purpose of the exercise, would arise because of the different principles on which internal transactions such as profit, depreciation and other operating provisions, stock changes and saving were calculated by different transactors. The definitions here would

intentionally not be uniform, so that the accounts would reflect the position as the transactors saw it themselves. Such a picture would be of considerable interest since decisions, insofar as they are based on accounting information, are affected by the definitions and conventions actually in use, which may differ from one transactor to another. The reason why such a scheme is not employed is that it does not lend itself very conveniently to aggregation, since the various transactions are not even in principle defined on a uniform basis.

A second possibility, and the one usually adopted to a greater or less extent in practice, is to keep the national accounts not from the point of view of actual transactors but from that of a hypothetical 'reasonable transactor' who adopts the principles and conventions which the investigator thinks desirable (and statistically manageable) in keeping his accounts. It is mainly for these purposes, namely the increased homogeneity of aggregations and the fact that in the opinion of the investigator the resulting accounts are more meaningful, rather than simply to permit aggregation at all, that various uniform definitions are proposed for income, depreciation and the like.

The final possibility is to attempt to keep the national accounts so that they reflect the costs and benefits of various operations to the community as a whole and not simply to the individual reasonable transactors whose accounts are being aggregated. In simple cases, as when a factory pours out smoke over the surrounding district, it can be seen that the consequential consumption of soap and laundry services by the local inhabitants may be regarded, from the community's point of view, as a cost of the factory's operations, although it is charged, in private accounts, not against the factory but against the householders. Much has been said on the desirability of keeping accounts on these lines, but it is found, on investigation, that the complications become so formidable that little or nothing has been achieved in practice. It is likely, however, that something would have to be done if a serious attempt were made to compare the national accounts of highly dissimilar economies, one highly industrialized and the other a primitive subsistence community.

Once these broad issues have been faced it is usual to look to economic theory to provide a framework and a set of concepts. This theory will, for example, indicate: distinctions between different forms of economic activity; the relationships between

these forms and terms such as income, consumption and saving; definitions of these terms; and, following from this, equations connecting them. It will also show that if a certain 'normal' environment is assumed in which, for example, competition is perfect and consumers' behaviour 'rational', then the parts of the conceptual system will fit together in a particularly neat way and various aggregations can be justified in theoretical terms.

The guidance of economic theory is useful, although in the actual world many situations arise which at the theoretical level are assumed away and despite the fact that the definitions of theory are not expressed in operational terms, that is to say they do not take the form of prescriptions for the empirical correlates of the theoretical concepts. In framing a conceptual system for use in applied work it is therefore necessary to supplement theory in two ways. First, a choice must be made in many matters of classification on which theory has little or nothing to say, and second, it is necessary to state precisely what operations are to be used in measuring the empirical correlates.

Theory contributes very little to the formation of institutional or product classifications. It can of course say that only things which are homogeneous in some sense should be grouped together, as when conditions are laid down for the grouping of commodities in the analysis of consumers' behaviour, but the main guidance in the matter of grouping must come from a knowledge of institutional, technical and legal conditions which make it desirable and practicable to put certain transactors or transactions into the same class.

In specifying in detail the empirical correlates of the theoretical scheme drawn up on the basis of these varied considerations resort must inevitably be made to conventions which can only rarely be dignified with the name of principles. The main object of these conventions is to indicate the precise method of treatment in cases which are not considered at the theoretical level. Thus, in practice, competition is not perfect and monopoly gains arise in certain industries. In private industry it is usually impossible to say how much of the profit in any industry represents monopoly gains and so it is agreed that no distinction should be made in such a case. Some kinds of activity are organized, however, in government enterprises, and in some of these, as in alcohol and tobacco monopolies, price fixing is used so as to yield a very substantial revenue which in other countries

is obtained by levying indirect taxes on products sold by private enterprise. It thus becomes necessary to consider whether certain profits should not be treated as indirect taxes and if it is agreed that they should then it is necessary to state in a way which will cover any case how the distinction is to be made. In such a situation it is possible to proceed in several ways. First it may be decided to leave the matter as it is, which in this case will mean that gains from economic operations will be treated as profit independently of the circumstances in which they arise. This course is an easy one to adopt but it may lead to a very heterogeneous concept of profit. A second course is to drop the distinction between indirect taxes and profits because of the difficulty of handling marginal cases such as this one. This course is also easy to adopt and will not lead to the same sort of heterogeneity as the last, but it will mean that profit (which of course may be given a different name) will be far removed from any idea of gain to proprietors from economic operations and so will not be useful where such a concept is appropriate. The third course is to introduce a convention which will preserve the distinction and specify the treatment of marginal cases. This course seems to be the right one if (i) the distinction is worth preserving and (ii) a convention can be framed which does not result in a spread of arbitrary distinctions through the system. This situation is essentially in the nature of a dilemma. If one decides that one will never make arbitrary distinctions, then one will soon find that it is hard to make any distinctions at all. If, on the other hand, one decides to make all the distinctions that seem desirable at the theoretical level, then one must remain undeterred in the face of an immense number of arbitrary distinctions.

It is extremely hard to devise criteria for resolving difficulties of this kind. The usual procedure is to consider in any problem the various borderline cases that arise and to decide in each case by weighing up the various considerations involved. Wherever possible it is of course desirable that there should be some objective distinguishing feature which permits the elements of two classes which are to be kept separate to be recognized. For example, most investigators would like to make a distinction between indirect and direct taxes since in the 'normal' world of theory the first do and the second do not affect relative prices. In practice it is not very easy to discover what effect tax changes

have on relative prices and so some associated criterion must be used. The distinction usually made is between taxes assessed on goods and services which appear as operating expenses of the enterprises from which they are collected and taxes assessed on income which can be determined only after income has been obtained as the surplus on the operating account and which may therefore be treated as debits on the appropriation account. If cases arise which cannot be settled on this basis, reference may be made to the fact that in the case of indirect taxes it is unusual in their assessment for any account to be taken of the individual circumstances of the tax-payer, whereas direct taxes can usually be distinguished by the fact that such circumstances are usually taken into account. By such means the theoretical distinction is translated into a distinction between ascertainable features of the transaction.

A number of devices for assisting or checking up on this process of translation have been proposed and these are to a greater or less extent in use. In the first place a formal approach may be adopted based on a number of relationships between carefully defined transactions. If this approach is employed then distinctions of the kinds not recognized at the outset are not subsequently made. In this way formal precision is given to solutions which are mainly along the lines of reducing drastically the number of distinctions made. In practice many comparatively harmless conventions and compromises which would help to make the estimates more useful are ruled out in advance, while certain other distinctions which are thought to be essential are preserved even if in principle the most suitable definition is very much in doubt. Desirable though it is to have elegance and precision in a system of concepts, there seems little doubt that a tidying-up process of this kind should follow and not precede the formulation of classifications and definitions.

In the second place there is always the possibility of deciding in favour of definitions which are found by experience to give rise to greater stability in relationships of a kind which are thought to be useful in analysis. Thus in defining the direct taxes to be charged against appropriation accounts it may seem desirable to attempt a distinction between those which may be supposed to fall upon income and those which may be supposed to fall upon capital. The object of making such a distinction is that both for the individual and for the private sector of the

economy the charging of capital taxes against income may result in a very irregular relationship between income and saving. If this is considered a good reason for attempting such a distinction, then workable empirical correlates to the two types of taxes may be found by distinguishing in the first place between taxes assessed on income and those assessed on capital and by then considering for special treatment cases which fall into both or neither categories.

This appears to be a useful type of guide and to some extent it is used. But in practice it is often not possible to test the hypothesis of simple relationships against observations until many years after the date when some provisional decision has to be taken. Furthermore, it is by no means certain that all relationships will be improved by devices of this kind which are usually proposed with one particular relationship in mind. Thus if individuals who have to pay capital taxes do not allow this greatly to affect their spending habits in relation to their income, while the governments which receive these taxes tend to treat them as income and to spend what they receive, then the different treatment of the two kinds of tax may improve the private income-saving relationship but make the corresponding relationship for public authorities less regular. At least this will be the case if the receipt and payment of the tax are treated symmetrically in the accounting system. It is always possible not to treat them symmetrically and the result will then be, in this case, that saving is not equal to asset formation but to this plus capital taxes. It is usually thought that this sort of asymmetry should be avoided as far as possible, but the experience of using alternative systems which could perhaps help to decide the matter is in most cases not available.

Another criterion which frequently comes up in discussions of definitions, but which is usually considered to be a bad one, turns on the intentions of one of the transactors. In fact, cases where this criterion has to be considered and even acted on are numerous. For example, it is usual to define the sector 'enterprises' (in distinction to the activity 'production') by reference to the profit-making character of certain transactors. By this is meant not that the transactors in question do invariably make a profit, but that they conduct their affairs so that they may expect to make a profit or at least recover their operating expenses from the proceeds of their sales. In a private enterprise

economy it is clear that a large number of transactors come within this definition, but there are always borderline cases, especially in connection with government agencies. Thus railway companies are usually regarded as enterprises and their rates are usually fixed so that they yield a return on the capital invested in them. But in the case of state railways the rates are sometimes fixed so that the yield is usually negative. It would be generally agreed that state railways should not be treated as a part of general government on that account. It might be thought necessary to revise the definition of enterprises by some reference to charges being made in relation to services rendered and in this case the treatment of enterprises as profit-making institutions, though modified, would not be abandoned. A second example of the use of this criterion which immediately follows from the first arises in deciding whether the state railways considered above should be deemed to make a loss or to receive a subsidy. Inasmuch as the amount to be paid to the railways is not fixed in advance in relation to the units of service provided, it is probable that in such a case the railway deficit would be treated as a loss and not as a subsidy. If this is done there results the class of enterprises that intend to make losses which is a contradiction in terms of the original definition.

III. EMPIRICAL CORRELATES AND DATA

The discussion so far has been concerned with theoretical and other concepts and their empirical correlates which, by definition, are in principle capable of measurement in the sense that a prescription for performing the measurements can be devised. It is necessary now to consider the link between these empirical correlates and the data actually available. Many things which are measurable in principle are not in fact measured, and in practice the types of sources used in making the estimates have an immense influence on them. The main difficulty in making international comparisons lies not in conceptual differences in different countries though these exist, nor even, if the economies are institutionally similar, in the conventions used in settling borderline cases where there is some freedom of choice in framing the conventions, but rather in the restrictions placed on the investigator by the nature of the data available. Given time, the sources of data can of course be changed, but in a subject as all-embracing as the national accounts any such changes

may well involve a large part of the structure of national statistics.

Differences in available data have the obvious effect that some countries can compile far more complete and detailed estimates than is possible in other countries. In the case of Switzerland[1], for example, detailed estimates are available of the components of the national income, but almost nothing is known about the components of the national expenditure. Even where many items in the national accounting framework can be filled in, many countries rely, and most countries have relied at one stage in their work, on estimates obtained as residuals in one or other of their accounts. Thus in the case of India[2] a simple accounting structure is presented based on (i) estimates of net value added, including depreciation, in different branches of activity, (ii) a consolidation and classification of the accounts of all public authorities, and (iii) a detailed analysis of the items of a current and a capital nature entering into the balance of payments. No estimates are however available at present of private consumption, private domestic gross asset formation, private provisions for depreciation or personal saving. These four flows cannot be obtained as residuals since they take place between three accounts, the domestic product account, the private appropriation account, and the consolidated resting account. The items on the government appropriation account and the account for the rest of the world are made to balance without residuals and so add no information for the present purpose. From the three accounts that do contain residuals, at most two items can be obtained from the accounting restrictions, which means that two of the unknown items must be estimated before the system of estimates can be completed even with the use of residuals. It can be seen that one of the two items to be estimated directly must be either private domestic gross asset formation or private provisions for depreciation, since both these flows take place between the domestic product account and the consolidated resting account.

In the case of Denmark,[3] to take another example, three

[1] *National Accounts Studies: Switzerland.* This report was prepared by the National Accounts Research Unit of O.E.E.C. and was published by the Organization, Paris, 1951.

[2] *First Report of the National Income Committee*, Ministry of Finance (Department of Economic Affairs) of the Government of India, Delhi, April 1951.

[3] *National Accounts Studies: Denmark*, National Accounts Research Unit of O.E.E.C., Paris, 1951.

residuals are obtained though one of these, net foreign lending which is derived from estimates of the current items in the balance of payments, can largely be checked through an annual census of foreign assets and liabilities. The remaining two items are the income distributed from enterprises to households, which is a residual on the current account of enterprises and the saving of households and private non-profit institutions which is a residual on the current account of these transactors.

In the case of the United Kingdom[1] the position is slightly different. The only residual is personal saving which is obtained by difference on the appropriation account for persons (households and private non-profit institutions). Domestic gross asset formation, which was formerly obtained as a residual on the national income and expenditure account, has for some years now been estimated directly. The account on which this residual was formerly obtained is still presented so as to show a balance without any statistical discrepancy. This result is achieved by allocating any discrepancy that appears on a trial balance among the various items and, in fact, to those which are known to possess a considerable element of uncertainty. Thus it cannot be said that any one component of the national income and expenditure is obtained as a residual, but the final estimates of several items are influenced by the whole body of data which enters the account.

In the United States[2] personal saving is likewise obtained as a residual, but it can be checked against the estimates of the Securities and Exchange Commission[3] which are made by adding up changes in assets and claims. In the national income and product account all items are directly estimated and a statistical discrepancy is shown. At one time consumers' expenditure was obtained as a residual.

The two countries last mentioned illustrate the case in which on one account all items are directly estimated, but not from such homogeneous sources that the estimates satisfy the accounting constraint automatically as happens, for example, in any proper analysis of the government accounts. If margins of error can be attached to the component estimates, then a statistical

[1] *National Income and Expenditure of the United Kingdom*, 1946–50, April 1951, Cmd. 8203, H.M.S.O.

[2] National Income and Product of the United States, 1949, *Survey of Current Business*, Vol. 30, No. 7, July 1950, pp. 5–35.

[3] *Volume and Composition of Individuals' Savings.* This series of statistical releases is issued regularly by the Securities and Exchange Commission.

adjustment can be performed.[1] A more comprehensive treatment of this problem in which allowance is made for systematic errors and for the simultaneous adjustment of the estimates over a series of years will shortly be given.[2]

Differences in the scope of available statistics are easily recognized. A more insidious influence on the comparability of estimates for different countries and one which is harder to detect, since it involves a greater knowledge of the basis of the different estimates, arises from the different kinds of statistical source on which reliance is placed.

In general there are at present three main methods used in compiling national accounts estimates. The first makes use of estimates of income based mainly on tax statistics, but supplemented in some cases by statistics of employment and earnings. The second relies on estimates of value added in different branches of activity based mainly on production statistics. The third attempts an estimate of final expenditures based on statistics of production, retail sales, government expenditures, capital expenditures, foreign trade and the like. In most cases it is found that countries rely on one of these methods to provide one of the basic aggregates and then obtain the others by piecing together such information as is available and by deriving what remains as residuals. In many cases the different sources may, of course, be checked against each other and discrepancies are usually evened out before publication. In what follows a critical examination of these methods will be made and a brief comment given on the most important classifications of the national aggregates.

In judging the relative merits of the three methods it will naturally be necessary to keep some standard in mind. It is hardly necessary for this purpose, however, to define in detail what this standard is; it is sufficient to say that it corresponds roughly to the national income and product as defined in the United Nations Report[3] or the Report of the National Accounts Research Unit.[4] These concepts cover broadly what is aimed at in most national income statistics.

[1] Richard Stone, D. G. Champernowne and J. E. Meade: The Precision of National Income Estimates, *The Review of Economic Studies*, Vol. IX, No. 2, Summer 1942, pp. 111–25.

[2] J. Durbin and H. R. Fisher, *The Adjustment of Observations with Applications to National Income Statistics*. To be published.

[3] *Measurement of National Income and the Construction of Social Accounts*, United Nations, 1947; reprinted 1950.

[4] *A Simplified System of National Accounts*, O.E.E.C. National Accounts Research Unit, 1951.

In countries with a well-developed income tax it will generally be found that tax authorities and business accountants have started to define an income concept before national accountants entered into the field and it is, therefore, one of the tasks of the latter to examine such concepts and test them against economic theory. With some notable exceptions which are mentioned below it will generally be found that, apart from some necessary rules of thumb, this concept will not deviate considerably from the one that is desired.

The important differences are, first, that tax authorities often include certain capital gains and losses in income. This will almost always be the case as regards speculative trading in real or financial assets and very often also as regards profits obtained by the revaluation of stocks. Secondly, the depreciation concept of the tax authorities is usually based on original cost rather than on replacement cost. This means, that statistics of taxable income will generally produce a net figure, that is, a figure net of the depreciation actually allowed as a deduction. If these deductions are not recorded, it will be extremely difficult from this source to make estimates of income before or after charging depreciation on a replacement cost basis.

The main weakness of statistics of taxable income is, of course, that owing to the purpose for which the information is collected it is influenced by tax evasion which may be of widely different importance in different forms of business organization and in different countries. Further, the use of tax statistics is often hampered by the fact that owing to exemption limits, special exceptions and the like, many incomes may not be recorded completely or may be entirely left out. As between different countries there can be little doubt that the income concept of the tax authorities may differ appreciably, for example, in the distinction between current and capital expenditure.

Estimates of national product based on the value added in different branches of activity do not suffer from these weaknesses of tax statistics, except as regards depreciation which is not usually obtained by this method. The method has the advantage of giving a relatively clear gross concept which might be adjusted by information from other sources, though in fact this adjustment is often made extremely difficult by problems arising from the treatment of repairs and maintenance.

The method has, however, weaknesses of its own. Probably

the most important of these are that production in small manufacturing firms, in trade and distribution and in several service trades can only be estimated with very considerable difficulty, and that incomes arising in non-profit institutions can in practice only be covered efficiently through tax statistics and may easily be overlooked in the present method. Furthermore, the information directly supplied by censuses at best shows 'value added' in a census sense and it is necessary to make still more deductions in respect of office expenses, advertising costs and numerous other services since these costs are usually not recorded. Other expenditure frequently charged to business account, such as meals in restaurants, cars mainly operated for business purposes, etc., will similarly have to be deducted. Information about all these deductions from 'value added' is usually very scarce and difficult problems arise in making allocations between private consumption and business expenditure.

For these reasons it will often be found that this method gives a comparatively high estimate of national product. The extent to which this happens will be seriously affected by the character of the information about small enterprises.

Estimates based upon statistics of expenditure suffer to some extent from the difficulties just mentioned. Thus many of the problems of allocating goods and services between consumption and business expenditure will necessarily arise, as also will many questions connected with the treatment of non-profit institutions. In addition, several difficulties are encountered in estimating asset formation, in the first place because it is difficult, except through production statistics, to obtain a good coverage of total domestic asset formation, and secondly, because it is necessary to estimate changes in stocks, an item which, of all those in the national accounts apart perhaps from depreciation, probably has the weakest statistical foundation.

In addition to the points already mentioned some others which are not related to any specific method may be indicated. One of these is the extent to which imputations are included in the national income and the ways in which these are estimated. The reliability of these items is likely to vary considerably from country to country. Other difficulties may be caused by the need to adjust from a cash basis to a receivable-payable basis as in the cases of the public accounts and the balance of payments. Except as regards the items specifically concerned, these adjust-

ments are hardly likely to cause any considerable lack of comparability.

As a consequence of these factors it is not easy at present to obtain comparable estimates of the national aggregates. Countries using tax statistics are likely to obtain a comparatively low estimate while countries using production statistics will, in most cases at any rate, obtain a comparatively high estimate. Countries using expenditure statistics are more difficult to place; on the whole they will probably obtain a higher estimate than countries using tax statistics while the outcome of a comparison with the second group is more uncertain.

It follows from the character of the deficiencies mentioned that the actual position of a given country in this rank is extremely uncertain, because it is difficult to evaluate whether the estimates of a country are influenced by these factors and, if so, to what extent. In particular this is unfortunately true when comparisons are made of net concepts, whether of product or of asset formation. It is obviously insufficient to base such comparisons on estimates which are only net of the depreciation provisions actually allowed for tax purposes, because these may differ considerably from country to country and from time to time owing to differences and changes in tax regulations.

It is therefore necessary to obtain estimates on a gross basis and then to deduct an estimated depreciation provision on a replacement cost basis. But in fact it is often impossible to do this even with tax statistics because in many cases no information is available about actual depreciation allowances. In view of the difficulties in adjusting depreciation provisions to a replacement cost basis, these estimates, as published by many countries, probably differ considerably both in coverage and in concept.

It therefore seems safe to conclude that the estimates of net product, etc., as they are made at present are rather dangerous for comparative purposes except where relatively rough figures are sufficient. Other comparisons might be made with greater advantage on the basis of a reasonable gross concept. Even this is at present difficult because of the variations in the 'grossness' of available estimates, especially as regards the treatment of repairs and maintenance. On the whole, however, it would seem easier to adjust the estimates to an acceptable gross concept (preferably gross asset formation excluding repair and maintenance) than to obtain comparable net figures.

When countries are in a position to use two or more methods for obtaining their estimates the reliability will usually be somewhat improved. The strength of this argument may easily be over-estimated, however, for the following reasons.

First, it is often found that the two calculations are not entirely independent of each other. Thus it is often impossible to check estimates which are rather weak, such as those for repair and maintenance. Secondly, the two calculations will produce totals which differ conceptually and which can be adjusted for these differences only on a more or less arbitrary basis. Finally, though this is of some importance, it will frequently be found on closer inspection that many sources of discrepancies remain and that adjustments have not, and perhaps cannot be made. As a result, relatively small differences between two estimates may be of a rather incidental character.

The difficulties of obtaining comparable aggregates are, of course, transmitted to the various components of the aggregates, such as distributive shares, final expenditures and industrial classifications, and since, in these, they will generally influence a relatively smaller flow the distortion may easily be considerable. This is particularly true as regards asset formation which is heavily influenced by the grossness of the concepts adopted and by the difficulties of estimating changes in inventories.

These classifications may be further impaired for comparative purposes by any mistakes in classifying the various components. Thus, for example, the allocation of motor-cars between personal and business use will influence the levels of consumption and asset formation.

These distortions are particularly likely to arise when components are derived as residuals and cannot be checked against other information. In many cases this will affect the estimates of profits on the income side and of consumption and/or stock changes on the expenditure side.

In the published estimates these various difficulties are only seldom disclosed; statistical discrepancies (of whatever origin) are usually adjusted away before publication and their existence, size and location is not indicated. Similarly the estimates are not shown in such detail that it is possible to see how individual items have been classified. For many purposes it is, of course, helpful to have adjusted figures, but for others it is desirable to know something about the nature of the adjustments.

So far in this section the statistical basis of final estimates has alone been considered. The need for up-to-date information has however resulted, in many countries, in the preparation of the national accounts estimates in several stages. Final estimates, compiled with the fullest use of available sources, can as a rule only be completed with a considerable time-lag, amounting to at least one year and in many cases even two or three years. In addition, some parts of the basic statistical data are only compiled intermittently. Thus, for example, censuses of trade and distribution are only taken every five or ten years in many countries, and similarly production in enterprises below a certain size is seldom regularly reported. When the estimates are made for a distant period in the past this deficiency may not be too serious because it will be possible to make reasonable interpolations between census years, but when up-to-date information is required this opportunity is not open. As regards postwar years, countries have only gradually resumed the taking of comprehensive censuses of production and distribution and the results of these have only gradually been forthcoming over the last year or two.

For these reasons countries have been forced into adopting various procedures for carrying forward their latest 'reliable' estimates. The somewhat scattered information which is available about these purposes suggests that they display considerable variety from country to country, since they depend on the amount of currently available statistics and on the speed with which 'final' estimates are provided.

Even if rough, these methods of extrapolation are often good enough to give an acceptable picture of the development of the country in question, but still it can probably be safely assumed that the comparability of the national income estimates is further reduced through these procedures. For one thing the indicators used for the year-to-year movements may have various biases. For example, an index of industrial production may be based on indicators for only a few trades, may reflect the increasing number of firms above a certain size or may measure production only in relatively large enterprises. In a similar way price indices often record price quotations which vary considerably from the prices at which the greater part of contracts are concluded.

Another difficulty in using these provisional estimates is that

the knowledge made available on the details of the calculations is not sufficient to permit the adjustment of the figures to other concepts and classifications.

Several estimates, especially of components, are often obtained more or less directly as residuals. In most provisional estimates the amount and importance of items obtained as residuals is generally much larger than in final estimates, and the possibilities of checking, even if only broadly, the level and year-to-year changes in the residuals are much smaller than in the case of final estimates.

Unless ample information is given about the methods of making provisional estimates, comparisons involving such estimates must be made with considerable caution. This is not to say that the differences actually existing between the final estimates of the countries are necessarily magnified in the compilation of provisional estimates, but rather that the margin of uncertainty is substantially increased, particularly as regards some of the components in the national aggregates.

IV. DESIRABLE FEATURES IN A STANDARD SYSTEM OF NATIONAL ACCOUNTS

In this section criteria for a good standard system will be suggested and in this way the scattered conclusions of the last sections will be brought together and amplified. It is not easy to compile such a list and the one given here is certainly not exhaustive or free from overlapping. The items are grouped, somewhat arbitrarily perhaps, into purely formal properties which may be associated in the main with the accounting aspect of the system, concepts and their specification which may be associated with the economic aspect of the system, and actual observations which may be associated with the statistical aspect of the system.

Thus, in the first place, it is necessary to record a number of formal properties of a system of national accounting, though it is unlikely that there will be much disagreement about them. Five in particular may be mentioned.

(1) There should be an accounting structure, even if only a simple one, which distinguishes between different sectors or institutions and between different forms of economic activity.

(2) Any account in the structure should be presented in consolidated form.

(3) The transactions should be recorded on a receivable-payable basis, account being taken of accruals, debtors and creditors.

(4) The accounting structure should be articulated, that is to say, each flow should have its separate counterpart elsewhere in the system so that the interrelationships of the transactions may be quite clear. It may not always be possible to retain this feature in all cases when actual estimates are made, but it should be part of the theoretical structure. If possible the basic structure should include balance sheets for the sectors as well as accounts containing flows.

(5) Concepts and terms should be so framed and used that transactions are invariant under addition. Thus the sum of the products (on some basis of valuation) of individual transactors in an economy should equal the total product (on the same basis) of that economy, and the sum of the products (on the same basis) of all economies in the world should equal the total product of the world.

The second group of desirable features in a system of national accounts relates to the concepts used, which are mainly to be derived from economic theory, and to the process of forming empirical correlates of these concepts. Nine in particular may be mentioned.

(6) The accounts should be kept from the standpoint of a reasonable transactor. This means that the entries in the individual accounts which, whether they are available or not, are aggregated notionally to form the national accounts must be assumed before aggregation to be adjusted to a standard set of definitions. These accounts are, however, still to be thought of as kept from the point of view of the individual transactor and as reflecting the costs and benefits which accrue to him and not those which accrue to the community at large as a consequence of his operations.

(7) The system must contain a clear concept of income from economic activity defined, for a closed economy, as equal to the net value of product and a clear concept of the division of this product between consumption and asset formation. These concepts are needed if the distinctions between (1) above are to be made. In drawing up these concepts it will be found necessary, among other things, to define internal provisions and transfers such as profit, provision for depreciation, increase in stocks and saving.

(8) Activity may be 'economic' or otherwise. Many types of activity can be fairly easily allocated to one class or the other. 'Living' in the sense of organizing one's domestic and private life is in many respects hard to classify. In most work relating to monetized, industrial economies it is assumed that 'living' can be separated out and that it is not a form of economic activity. This idea, though not wholly precise, may be regarded as an amplification of (7) which permits many difficult imputations to be ignored. The fact that in many primitive economies this distinction is not even roughly drawn makes it particularly difficult to compare these economies with highly developed economies or, indeed, with one another.

(9) In the valuation of goods and services, market prices should, in general, be accepted as a guide. Once a valuation on this basis has been obtained it will for many purposes be necessary to adjust to a factor cost basis of valuation by the addition of subsidies and the subtraction of indirect taxes.

(10) The system must contain a distinction between the economy under investigation and the rest of the world. It should also contain the distinction between 'domestic' and 'national' concepts since, to give one reason, the former is more appropriate as a basis for constructing a measure of real product. This requirement is not independent of (5) above.

(11) The system must contain a distinction between transactions which involve goods and services and those which do not. This requirement is probably implicit in (7) but is mentioned separately because of its importance in con-

nection with adjustments for price changes. Transactions involving goods and services can be adjusted for price changes by relating the quantity of goods and services of which they represent the value to the corresponding value in some base period. Among transactions involving goods and services a distinction must be made between the services of the factors of production and the rest.

(12) Transactions not involving goods and services must also be further subdivided. The principal distinction is between transfers, or unilateral transactions, and transactions involving claims. If capital gains and losses, whether realized or not, are to be included in the system then they should be kept separate from other transactions.

(13) In classifying transactors regard should be had to homogeneity of response which may arise from technological factors or from similarities of the influences taken into account in reaching decisions. This last consideration provides, perhaps, the main reason for the usual distinction between the private and public sectors of the economy. Within 'industry' in the ordinary sense of the term it is homogeneity in input-output relationships, which is dependent largely on technical considerations, that provides perhaps the soundest basis for classification.

(14) In settling borderline cases in the various classifications the use of conventions cannot be avoided. These should be related whenever possible, however, to some ascertainable characteristic of the transaction and not to the supposed intention of the transactor or other such subjective factor which may not be ascertainable. The improvement of regularities in relationships may be a useful guide in allocating borderline cases. It is doubtful, however, whether anything useful can be gained by limiting, on technological grounds and in advance of experience, the kinds of distinction that are to be taken into account.

The third group of desirable features relates to the availability and use of data, the effect of this on the empirical correlates to be chosen and the descriptions given of the resulting estimates.

(15) It is obvious that the elements of the system chosen must be capable of being estimated in practice and this in itself

will impose numerous simplifications on the treatment that can be adopted. If a system is to be used as a basis for international comparisons, then it must not invite misleading comparisons due to differences in sources in different countries and it should be framed with this kind of limitation in mind. As sources change, the implications of this restriction will change also.

(16) Imputations sometimes have to be made to improve comparability, for example between those who rent their houses and owner-occupiers. Lack of exact information may prevent imputations being made which would otherwise be desirable, since it may be better to have no imputation than a highly uncertain one. This is particularly likely to be the case if the imputed item is simply a constant or a trend. Thus on practical grounds it will usually be found difficult or impossible to treat consumers' durable goods as assets. The reason for this is not merely that most individuals do not make provision for the depreciation of their durable goods, but also that information on the stock and mortality rates of such goods is almost never available, so that the estimates would be very rough and probably not very comparable over countries.

(17) Finally, and this is a point of a rather different kind, the main sources used in estimating the elements of the system should be stated explicitly together with the adjustments made. Residuals should in all cases be indicated and an attempt should be made to assess the reliability of the different estimates. Without this kind of information it is not easy to interpret the estimates nor to compare them. Reasons have already been given for thinking that in practice it is differences in basic sources that lead to the most serious difficulties in making international comparisons at least between highly developed and fairly homogeneous economies.

V. REAL COMPARISONS OVER TIME

No attempt will be made in this section to treat the many difficulties of making real comparisons over time; the purpose of it is, rather, to indicate a general point of view in approaching

this work and some of the consequences that it has for desirable features in an accounting system.

The first point to be made is that the collection of price and quantity data and the construction of price and quantity index numbers are complementary procedures and should be carried out on a common plan. The older idea that price index numbers, and especially wholesale price index numbers are intended to measure, in some sense not clearly defined, changes in the value of money, is giving way among official statisticians[1] to the idea that these index numbers should be constructed so as to relate to some significant aggregate of transactions. Thus, with sufficient data, complementary price and quantity index numbers could be constructed which would multiply out to the change in the value of related transactions.

In the second place it has been generally recognized since the outstanding work of Geary[2] that, in constructing an index of output by summing the value added in each trade, it is necessary in principle to take account of the quantity changes in inputs as well as in outputs and that the former can only be neglected if it can be assumed that it varies proportionately to the quantity of output. It will readily be recognized that a similar principle must be observed in constructing price indices if the object is to deflate not output but value added.

On this basis a comprehensive scheme for the construction of price and quantity index numbers can be set out as follows. A matrix notation is used because what is sought is a large system of interrelated index numbers. Without it only simplified examples could be given instead of the general case and, even so, the notation would be more involved and the algebra would be more tedious than is necessary.

Suppose there are N accounts and m products. Define an $Nm \times N$ quantity matrix $\mathbf{q}$ as a matrix with N columns, each of which contains the goods and services bought by one account from the others, and with m rows for each account, each one of which contains the sales of one product by the given account

[1] H. Bartels and G. Furst, Preisindices im volkwirtschaftlichen Guterkreislauf, *Wirtschaft und Statistik*, 1st year, New Series, No. 9, December 1949, pp. 261–8. Also J. Stafford, Indices of Wholesale Prices, *Journal of the Royal Statistical Society*, Series A (General), Vol. CXIV, Pt. IV, 1951, pp. 447–59.

[2] R. C. Geary, The Concept of the Net Volume of Output with Special Reference to Irish Data, *Journal of the Royal Statistical Society*, Vol. CVII, Pts. III–IV, 1947, pp. 251–51 and 290–2.

to all other accounts. Thus if q_{rs}^{k} denotes the quantity of product k sold by account r to account s, then

$$\mathbf{q} = \begin{Bmatrix} 0 & q_{12}^{1} & \cdots & q_{1N}^{1} \\ \vdots & \vdots & & \vdots \\ 0 & q_{12}^{m} & \cdots & q_{1N}^{m} \\ q_{21}^{1} & 0 & \cdots & q_{2N}^{1} \\ \vdots & \vdots & & \vdots \\ q_{21}^{m} & 0 & \cdots & q_{2N}^{m} \\ \vdots & \vdots & & \vdots \\ q_{N1}^{1} & q_{N2}^{1} & \cdots & 0 \\ \vdots & \vdots & & \vdots \\ q_{N1}^{m} & q_{N2}^{m} & \cdots & 0 \end{Bmatrix} \qquad (1)$$

The zeros indicate that the accounts are in consolidated form, that is the transactors do not buy any product from themselves. The possibility is envisaged in (1) that every account might sell each product. In fact, of course, this will not be the case and the great majority of the rows of (1) will contain nothing but zeros. If there was one-one correspondence between accounts and products, then $m-1$ of the m rows for each account would contain nothing but zeros, and so these rows could be removed from the matrix which would thus reduce to an $N \times N = m \times m$ square matrix.

In correspondence with **q**, let **p** be defined as an $Nm \times N$ price matrix in which the zeros of **q** are replaced by the prices of the products to which the rows in question relate and in which the remaining elements of **q** are replaced by zeros. *See* p—(2) p. 128.

No differentiation is made here between the N values of p^k since it is assumed that any product which is sold by several industries will be sold at the same price by each one.

The structure just described relates, as in the Leontief system, to a complete, closed system of transformation processes. For the sake of simplicity it may be assumed that the first $N-1$

$$\mathbf{p} = \begin{Bmatrix} p^1 & 0 & \cdots & 0 \\ \vdots & \vdots & & \vdots \\ p^m & 0 & \cdots & 0 \\ 0 & p^1 & \cdots & 0 \\ \vdots & \vdots & & \vdots \\ 0 & p^m & \cdots & 0 \\ \vdots & \vdots & & \vdots \\ 0 & 0 & \cdots & p^1 \\ \vdots & \vdots & & \vdots \\ 0 & 0 & \cdots & p^m \end{Bmatrix} \qquad (2)$$

accounts are the operating accounts of N−1 industries in the ordinary sense and that the Nth account is a consolidated account of everything else, which again for the sake of simplicity may be assumed to relate to households and to contain their purchases of consumers' goods and services and their sale of factor services. In fact, this account may be given a much more general connotation as will become apparent. No account balances by definition, since only transactions involving goods and services are under discussion.

In conformity with the terminology of a previous article[1], the goods and services transaction matrix for the economy may be denoted by $\mathbf{w}_{rs}$ or, more briefly for present purposes, by $\mathbf{w}$. This is an $N \times N$ matrix of inter-account sales and purchases of goods and services. Thus

$$\mathbf{w} = \mathbf{p}'\,\mathbf{q} \qquad (3)$$

where $\mathbf{p}'$ is the transpose of $\mathbf{p}$, that is the $N \times Nm$ matrix obtained by interchanging the rows and columns of $\mathbf{p}$. Each element w_{rs} of $\mathbf{w}$ contains the sum of the sales proceeds obtained from the selling of various goods and services by account r to account s. Thus, writing $\mathbf{1} = \{1, 1, \ldots, 1\}$,

[1] Richard Stone, Simple Transaction Models, Information and Computing, *The Review of Economic Studies*, Vol. XIX (2), No. 49, pp. 67–84.

$$\mathbf{w}\,\mathbf{1}=\mathbf{p}'\,\mathbf{q}\,\mathbf{1} \tag{4}$$

is the column vector of total sales proceeds of each account, and

$$\mathbf{w}'\,\mathbf{1}=(\mathbf{p}'\,\mathbf{q})'\,\mathbf{1} \tag{5}$$

is the column vector of the purchases of goods and services by each account. If factor services are left out of the summations in (5) then, since these appear in the final column of $\mathbf{w}'$, the multiplier is not $\mathbf{1}$ but $\{1, \ldots, 1, 0\}$ here denoted by $\hat{\mathbf{1}}$. Then

$$\mathbf{w}'\,\hat{\mathbf{1}}=(\mathbf{p}'\,\mathbf{q})'\,\hat{\mathbf{1}} \tag{6}$$

is the column vector of the purchases of goods and services, other than factor services, by each account.

The matrices $\mathbf{p}$ and $\mathbf{q}$ may be established for different time periods, t, and denoted by $\mathbf{p}_t$ and $\mathbf{q}_t$ respectively. In accordance with the usual symbolism of index numbers t will here take the values 0 and 1. Thus

$$\mathbf{w}_{01}=\mathbf{p}_0'\,\mathbf{q}_1 \tag{7}$$

is the goods and services transaction matrix of quantities transacted in period 1 valued at the prices ruling in period 0. Then, the quotient of two-column vectors, denoted by $\mathbf{x}/\mathbf{y}$ where $\mathbf{x}=\{x_1, \ldots, x_N\}, \mathbf{y}=\{y_1, \ldots, y_N\}$ being defined here to be the column vector with elements $x_1/y_1, \ldots, x_N/y_N$,

$$\mathbf{w}_{01}\,\mathbf{1}/\mathbf{w}_{00}\,\mathbf{1}=\mathbf{p}_0'\,\mathbf{q}_1\,\mathbf{1}/\mathbf{p}_0'\,\mathbf{q}_0\,\mathbf{1} \tag{8}$$

is the column vector of base-weighted gross output index numbers of the N accounts, while

$$\mathbf{w}_{01}'\,\hat{\mathbf{1}}/\mathbf{w}_{00}'\,\hat{\mathbf{1}}=(\mathbf{p}_0'\,\mathbf{q}_1)'\,\hat{\mathbf{1}}/(\mathbf{p}_0'\,\mathbf{q}_0)'\,\hat{\mathbf{1}} \tag{9}$$

is the column vector of base-weighted input index numbers (excluding factor services) of the N accounts. Accordingly

$$(\mathbf{w}_{01}\,\mathbf{1}-\mathbf{w}_{01}'\,\hat{\mathbf{1}})/(\mathbf{w}_{00}\,\mathbf{1}-\mathbf{w}'_0\,\hat{\mathbf{1}})=$$

$$=[\mathbf{p}_0'\,\mathbf{q}_1\,\mathbf{1}-(\mathbf{p}_0'\,\mathbf{q}_1)'\,\hat{\mathbf{1}}]/[\mathbf{p}_0'\,\mathbf{q}_0\,\mathbf{1}-(\mathbf{p}_0'\,\mathbf{q}_0)'\,\hat{\mathbf{1}}] \tag{10}$$

is the column vector of base-weighted net output (value added) index numbers of the N accounts.

If the elements in the column vector representing a net output matrix are summed then all the intermediate products will cancel out. Thus if $\dot{\mathbf{1}}$ denotes $\{0, \ldots, 0, 1\}$, then

$$\mathbf{1}'(\mathbf{w}_{01}\mathbf{1}-\mathbf{w}'_{01}\hat{\mathbf{1}})=\mathbf{1}'\mathbf{w}_{01}\dot{\mathbf{1}} \tag{11}$$

or in other words the value of the aggregate of net outputs of the N−1 'industries' is identical to the value of the aggregate of gross outputs of final goods. This is obviously true whatever prices are taken, and so

$$\mathbf{1}'(\mathbf{w}_{01}\mathbf{1}-\mathbf{w}'_{01}\hat{\mathbf{1}})/\mathbf{1}'(\mathbf{w}_{00}\mathbf{1}-\mathbf{w}'_{00}\hat{\mathbf{1}})=\mathbf{1}'\mathbf{w}_{01}\dot{\mathbf{1}}/\mathbf{1}'\mathbf{w}_{00}\dot{\mathbf{1}} \tag{12}$$

Thus the same result is obtained by making a net output index for all operating accounts (industries) as for making a gross input index for all other accounts (final output).

It is convenient to define a price index corresponding to any quantity index in such a way that their product is equal to the change in value of the corresponding transactions. If in some sense there is a bias in either, these biases will be offsetting. In the above notation these corresponding price indices are obtained by changing the suffixes in the matrices. Thus

$$\frac{\mathbf{1}'\mathbf{w}_{01}\dot{\mathbf{1}}}{\mathbf{1}'\mathbf{w}_{00}\dot{\mathbf{1}}}\cdot\frac{\mathbf{1}'\mathbf{w}_{11}\dot{\mathbf{1}}}{\mathbf{1}'\mathbf{w}_{01}\dot{\mathbf{1}}}=\frac{\mathbf{1}'\mathbf{w}_{11}\dot{\mathbf{1}}}{\mathbf{1}'\mathbf{w}_{10}\dot{\mathbf{1}}}\cdot\frac{\mathbf{1}'\mathbf{w}_{10}\dot{\mathbf{1}}}{\mathbf{1}'\mathbf{w}_{00}\dot{\mathbf{1}}}=\frac{\mathbf{1}'\mathbf{w}_{11}\dot{\mathbf{1}}}{\mathbf{1}'\mathbf{w}_{00}\dot{\mathbf{1}}} \tag{13}$$

or, as is well known,

$$\Lambda\mathrm{P}=\mathrm{L}\Pi=\mathrm{W} \tag{14}$$

where Λ and Π denote Laspeyres and Paasche index numbers of final products, L and P denote Laspeyres and Paasche index numbers of final product prices and W denotes the change in value of expenditure on final products over the period of comparison. It can be seen that a similar duality runs all through the index numbers discussed here and that for example

$$\frac{\mathbf{1}'(\mathbf{w}_{01}\mathbf{1}-\mathbf{w}'_{01}\hat{\mathbf{1}})}{\mathbf{1}'(\mathbf{w}_{00}\mathbf{1}-\mathbf{w}'_{00}\hat{\mathbf{1}})}\cdot\frac{\mathbf{1}'(\mathbf{w}_{11}\mathbf{1}-\mathbf{w}'_{11}\hat{\mathbf{1}})}{\mathbf{1}'(\mathbf{w}_{01}\mathbf{1}-\mathbf{w}'_{01}\hat{\mathbf{1}})}=\frac{\mathbf{1}'(\mathbf{w}_{11}\mathbf{1}-\mathbf{w}'_{11}\hat{\mathbf{1}})}{\mathbf{1}'(\mathbf{w}_{00}\mathbf{1}-\mathbf{w}'_{00}\hat{\mathbf{1}})} \tag{15}$$

exhibits the fact that the sum of a set of net output (value added) index numbers each multiplied by the corresponding index number of net output prices is equal, by (11), to the change in the value of final products. Similarly, the index number of the net output of any operating account multiplied by the corresponding index of net output prices is equal to the change in the value of the net output of that account. Thus given $\mathbf{p}_0$, $\mathbf{p}_1$, $\mathbf{q}_0$ and $\mathbf{q}_1$ a completely consistent system of price and quantity index numbers relating to value added and total sales of each

operating account and the aggregate of all operating accounts can readily be constructed.

No special reference has been made so far to the prices and quantities of factor inputs, many of which are extremely difficult to measure. The column vector of these factor inputs for each operating account is represented in the above scheme by

$$\mathbf{w}' \dot{\mathbf{i}} = (\mathbf{p}' \mathbf{q})' \dot{\mathbf{i}} \tag{16}$$

and it can be seen, since $\hat{\mathbf{1}} + \dot{\mathbf{i}} = \mathbf{1}$, that (5)=(6)+(16). Thus if the relevant prices and quantities could be defined and measured

$$\frac{\mathbf{1}' \mathbf{w}_{01}' \dot{\mathbf{1}}}{\mathbf{1}' \mathbf{w}_{00}' \dot{\mathbf{1}}} = \frac{\mathbf{1}' (\mathbf{p}_0' \mathbf{q}_1)' \dot{\mathbf{i}}}{\mathbf{1}' (\mathbf{p}_0' \mathbf{q}_0)' \dot{\mathbf{i}}} \tag{17}$$

would give a measure of the change in the aggregate quantity of factor input in the economy. The ratio of the change in the net output of all operating accounts, which as has been seen is the same as the change in the gross output of all final products, to the change shown in (17) would provide a definition of the change in the productivity of the entire economy. This ratio could, of course, be calculated with base or with current weights. Any attempt to remove this inherent 'index number' uncertainty from the comparison would require that a hypothetical set of 'desirable' and consistent weights should be constructed. Even if this could be done the resultant set of weights would presumably not be unique, so that a range of uncertainty would still remain.

It was assumed above, in order to assist a common sense appreciation of the equations, that the Nth account contained simply the purchases and sales of goods and services by the factors of production consolidated in an account called 'households'. It is not difficult to see that the interpretation of this account can be widened to include all other non-operating activities. Thus if capital transactions are included in the Nth account, the final column will contain gross asset formation as well as consumers' goods and services, but the final row will be unaffected since the finance of asset formation does not involve goods and services. The factor services will of course include those devoted to asset formation.

If government current expenditures are included in the Nth column it is possible to proceed without any formal change, but more meaningful and statistically more manageable calculations will result if an attempt is made to distinguish between the final and intermediate products of government. This would involve a new operating account, or set of operating accounts, for government operating activity which would show, in the columns, the purchasing transactions of government involved in producing the 'services to industry' and in the rows the 'sales' (at cost) of these services to the industries which benefited from them. Taxes of all kinds would not affect the picture; all transactions, whether in final products, intermediate products or factor services, would have to be valued at market prices, except in cases where there was no market when they would be valued at 'cost' or at factor cost.

Again, the introduction of foreign trade does not make any substantial difference. The essential feature is that exports are a part of final output, whereas imports are a part of input, and so it will be desirable to have another m rows and a column in the matrices and a slightly different partition of the adding multiplier $\mathbf{1}$ in some of the equations.

When the procedures actually used to obtain estimates expressed in terms of constant prices are examined it is seen that very few countries have managed to get as far as has been indicated here. As in the estimates expressed in current prices, a considerable range of estimates are found ranging from the rough deflation of a national aggregate by means of a cost-of-living index number to the more refined methods recently used in the United Kingdom and the United States. In addition, even less information is usually given about the methods of deflation than is available about the compilation of data in current prices.

The technique outlined here will, if it is to be applied in practice, require a vast amount of factual information which at present very few countries are able to provide. On the other hand it is, in fact, a very simple way of indicating the whole complex of problems connected with methods of deflation, and can conveniently be used as a point of departure even when the methods actually employed fall considerably short of the ideal.

Thus, for one thing, it emphasizes the important rôle played by price index numbers in this process. As mentioned above, it

is often found that the material on prices collected by various official bodies and used for the construction of price indices are, though they may be useful for some purposes, of little relevance for the present purpose. The reason is partly that they are weighted in accordance with other criteria, partly that the price data may have a rather loose connection with the transactions taking place within the accounting period, as is frequently the case with the price quotations used in wholesale price indices. In both cases the deflated series may often be considerably distorted.

Secondly it employs the Geary formula, with its emphasis on the separate deflation of input and output elements, and thus establishes the logical connection between the various methods which may be employed when the complete approach is ruled out. What has been described here in fact amounts to deflating all entries in an input-output table. Even if that cannot be done in practice it should be possible to establish a deflation of the expenditure on final goods and services and/or of the net product in the various industries (obtained by deflating output and input separately) and these two estimates may then be compared.

Recently both these methods have been used in two highly detailed investigations, unfortunately not for the same country, into the measurement of changes over time in real product. The first of these has been undertaken by a group at Cambridge and relates to changes in the domestic product of the United Kingdom since 1946, estimated by means of a complete set of net output index numbers. The results of this inquiry have appeared and are still appearing in a series of papers by Reddaway[1] and by Carter.[2] The second project relates to changes in the national product of the United States since 1929, estimated by means of a complete set of gross final product index numbers or the corresponding index numbers of the prices of final goods in

[1] W. B. Reddaway, Some Problems in the Measurement of Changes in the Real Geographical Product, *Income and Wealth Series I*, Bowes & Bowes, for the International Association for Research in Income and Wealth, 1951, pp. 267–92. Also Movements in the Real Product of the United Kingdom, 1946–49, *Journal of the Royal Statistical Society*, Series A (General), Vol. CXIII, Pt. IV, 1950, pp. 435–55. Also The Real Product of the United Kingdom, 1946–49, *Bulletin of the London and Cambridge Economic Service*, August 1950, pp. 79–83.

[2] C. F. Carter, The Real Product of the United Kingdom, 1946–50, *Bulletin of the London and Cambridge Economic Service*, August 1951, pp. 75–77. Also Index Numbers of the Real Product of the United Kingdom, *Journal of the Royal Statistical Society*, Series A (General), Vol. CXV, Pt. I, 1952, pp. 82–126.

association with estimates of expenditures on these goods. A brief account of the methods employed has been published.[1]

As is also apparent from the algebraic treatment above, the method described has been designed simply for the construction of series of 'quantities' of goods and services. From another point of view it is customary instead to conceive of 'deflation' as a means of expressing the value in real terms of the income of a person or a group of persons. On a national scale this requires that account be taken of the effects of changes in the terms of trade of the country as well as of the changing purchasing power of its income from foreign investments.[2] When the economic position of different groups, such as different groups of households or different countries, is examined this type of analysis assumes even greater importance, but on the other hand, this approach will before long lead into questions of needs, tastes, income distributions, etc., that is, into problems of welfare economics which will not be discussed here.

VI. REAL COMPARISONS OVER SPACE

The general problem of making these comparisons can be set out in terms of the scheme given in the last section. The suffixes 0 and 1 now relate not to two time periods but to two countries. When the matter is set out in this way then, even if the detailed comparisons of industrial net outputs are not required, it can be seen that this stage in the making of international comparisons involves formidable difficulties. For the relevant parts of the matrices (1) and (2) must be comparable, which implies that the classification systems in the two countries are substantially the same in a very detailed way. Furthermore, differences in valuations between countries are likely to be much greater than the corresponding differences over time, unless the time period is a very long one, so that $\mathbf{p}_0$ and $\mathbf{p}_1$ will be much more dissimilar for countries than for time periods, with the result that the comparison will be much affected according to which set of prices is used as weights.

In practice, no attempts have ever been made to work with

[1] G. Jaszi and J. W. Kendrick, Estimates of Gross National Product in Constant Dollars, 1929–49, *Survey of Current Business*, Vol. 31, No. 1, January 1951, pp. 6–11.

[2] W. B. Reddaway, Movements in the Real Product of the United Kingdom, 1946–49, *loc. cit.*

so elaborate a scheme. A project is, however, now in hand at the Department of Applied Economics, Cambridge, in which comparisons are being attempted between the level of final products in a number of countries, such as the United States, the United Kingdom, Eire, Sweden and the Netherlands, which are relatively homogeneous and for which fairly detailed estimates are available. The easiest part of this kind of inquiry relates to consumers' expenditures, and some interesting work on the relative positions of the United States, the United Kingdom and Canada has been reported.[1] A check on this kind of calculation is possible if the inter-country comparison can be made at two dates and if within-country comparisons can be made in each case between these dates. In this way a closed circuit of comparisons is established, the ratios in which are restricted by the fact that they must multiply out to unity. This check is being employed in the Cambridge study just mentioned.

The need for comparisons in real terms combined with the lack of statistical information has led to the use of various short-cut devices. The most obvious of these is the use of exchange rates to adjust estimates, say of national product, expressed in local currencies. This method was used by Stone[2] and on an altogether more comprehensive scale by the United Nations.[3] It is evident that this method is likely to give better results under conditions of free exchanges than under conditions of exchange control. Accordingly in making post-war comparisons the Economic Commission for Europe made inter-country comparisons for 1938 and carried these through to 1948 by the use of estimates of the change in real product within the different countries.[4] This device, however, requires that comparatively accurate and uniform measures of the changes in real product are available in a number of countries.

Another possibility of dealing with this problem is to use 'free' exchange rates, such as the rates quoted on the Swiss exchange market after the war, when such rates are available.

[1] *The Impact of the War on Civilian Consumption in the United Kingdom, the United States and Canada*, H.M.S.O., 1945.

[2] Richard Stone, The Measurement of National Income and Expenditure: a Review of the Official Estimates of Five Countries, *The Economic Journal*, Vol. LVII, No. 227, September 1947, pp. 272–98.

[3] National and Per Capita Incomes of Seventy Countries in 1949 expressed in U.S. Dollars, *Statistical Papers*, Series E, No. 1, Statistical Office of the United Nations, October 1950.

[4] *Economic Survey of Europe in 1948*, United Nations Economic Commission for Europe, Geneva, 1949. See Appendix A, pp. 229–40.

But these rates are in general so influenced by the legal regulations in force in the countries operating exchange controls, as well as by speculative transactions, that they can hardly be assumed to give a 'true' picture of the relationships between the currencies.

A final possibility is then to calculate theoretical exchange rates on the basis of exchange rates in a year which is supposed to be fairly 'normal' and the changes in prices, wages, productivity, etc., which have taken place since this base year. The margin of error in this procedure is, however, very considerable because the amount of statistical data available is quite insufficient.

Furthermore, even when relatively free rates of exchange are in operation the results of such a calculation must be used with the greatest caution. Thus the exchange rates reflect not only differences between price levels in local currencies but also differences in the level of employment, international capital movements, customs tariffs and similar regulations of foreign trade. Besides, the adjustment of the internal price levels of the countries to the external value of the currencies is a rather slow process, particularly in the case of rents and similar payments. As a result the exchange rates primarily reflect differences in price levels of goods which, actually or potentially, are traded internationally and not the differences in prices of the much wider range of goods and services which enter into the total national product. In time, wage rates and profit margins throughout the economy may adjust themselves to the exchange rate, but the period of adjustment may be extremely prolonged.

There is another source of data for this kind of inter-country comparison which deserves consideration. International organizations and the foreign offices of many countries are faced with the problem of adjusting salary scales in different countries so as to yield a similar standard of living to officers in the same grade in different parts of the world. In some cases elaborate inquiries have been made for this purpose though, so far as is known, no results have been published. Interesting as this information would be, it has obviously severe limitations since the standard of living of diplomats is obviously unrepresentative, partly because of their very public life, partly because they are foreigners in the countries to which they are accredited and so, presumably, live in an untypical way, and partly because

they have special immunities and privileges such as freedom from customs duties and special supplies from their own country. Furthermore, the relative rates of remuneration of these officers are likely to be fixed to some extent on political and personal grounds. Thus while the detailed information collected for this purpose would be useful, it is unlikely that much could be inferred from such information on salaries and expenses as is made public.

VII. THE WORK OF THE NATIONAL ACCOUNTS RESEARCH UNIT

The National Accounts Research Unit of the Organization for European Economic Co-operation was established in the summer of 1949. Its object is to assist the work of the Organization by providing more ample information about the concepts and methods used by the Participating Countries in the compilation of their national accounts and about the reliability of the estimates made and by helping in the provision of more comparable information.

The problems of the Unit are therefore very much the same as those set out in the earlier sections of this paper. The first requirement was a standard to which the estimates of the different countries could be adjusted and in terms of which the actual content of these estimates could be described and judged.

It was thought best in the first instance to provide a simpler system of accounts containing only the elements needed in building up the main national accounting aggregates, but showing by means of a fully articulated system the precise nature of the component flows. No attempt was made at this stage to specify classifications of the main aggregates such as national product, consumers' expenditures, asset formation and so on, because it was thought that more experience was necessary before standard classifications could usefully be proposed.

A report entitled *A Simplified System of National Accounts*[1] was completed in April 1950 and was used as a basis for compiling the *National Accounts Studies* for different countries described below. Comments on the Simplified System were received from many quarters, and these comments together with the experience gained in preparing the country studies have

[1] *Op. cit.*

provided a basis for a revised standard system which is due to be discussed shortly after this conference.

In preparing the Simplified System it was recognized that differences in sources might easily lead to a lack of true comparability even in flows which in principle had the same content. Accordingly an attempt was made to give rigorous definitions to the concepts employed in the hope that this would help to bring differences to light. It was also recognized that the System would probably require modification in the light of experience gained in using it. It was hoped that in this way, by an interplay of theory and practice, it would be possible to evolve a system of definitions and presentations which would be adopted for comparative purposes by the various countries. It was expected that many countries with highly developed statistics would require more elaborate, or even slightly different, systems for their own internal purposes.

Two of the country studies[1] have so far been published and from the first of the series, which relates to Denmark, a clear idea can be gained of the plan of the work. Thus wherever possible the available information and the adjustment of this to the definitions of the Simplified System is set out in eight sections as follows.

(1) A preliminary account is given of the sources, terminology and basic concepts used in the country. This section enables the general approach and procedures to be understood before the innumerable details of classification and estimation are introduced.

(2) The accounting structure, as set out in the Simplified System, is completed for each of the years 1938 and 1946 onwards. The entries are adjusted so as to conform as closely as possible to the definitions of the Simplified System. A brief account is given of the methods used to balance the accounts with a note of any items which are obtained as residuals.

(3) This section contains detailed comments on the entries in the tables of Section (2) and sets out the adjustments required to pass from the items in the country's own accounts to the corresponding items in the above tables.

[1] Reports for Denmark and Switzerland, *op. cit.*

(4) Since, as has been stressed in this paper, the sources available exercise a considerable influence on the estimates, a brief account of the methods of compilation and the reliability of the estimates is given. This is a subject which could be treated at very great length and partly for this reason is often not treated at all. Consequently even a short treatment is useful.

(5) Since the main tables contain relatively little subdivision of the main aggregates, detailed classifications, wherever available, are given in this section. As already mentioned, no attempt has been made in the studies so far completed to present these on a uniform basis, although of course they would be more useful if this could be done. The number of items that can be classified in detail and the dates for which this can be done vary from country to country.

(6) This section contains a description of the methods, in use in many countries, in constructing short-term forecasts of the national accounts and also tables showing the current forecasts adjusted as far as possible to the standard definitions. Although the tables of forecasts prepared in different countries have a similar appearance, the objectives and assumptions which underlie their construction vary from country to country and must be taken into account if the estimates are to be understood and compared.

(7) Some estimates in fixed prices are usually available in each country, but the extent of these and the methods used vary enormously. A brief account is given of the deflated series available and of the method of estimation adopted.

(8) A concluding section sets out what is known of new developments in the preparation of the national accounts and in the sources available for this purpose.

Apart from the two country studies already published, similar reports have been completed for France and the Netherlands. Work on reports for Germany, Italy, the United Kingdom and Sweden is already in an advanced stage. It is intended that these studies should be published in due course and that work should be put in hand on studies for the other Participating Countries.

In the new version of the Simplified System mentioned above an attempt has been made to get somewhat further in the matter of classification by including among the tables of the revised System a series of explanatory tables showing classifications of all important national aggregates. It is hoped that it will be possible later to obtain agreement on a relatively detailed set of definitions of these flows and thus in time provide users with a considerable number of building blocks of use for analytical purposes. These explanatory tables are, however, necessarily limited by the fact that many Participating Countries still lack many data required for the construction of more detailed accounts.

Another matter on which work at the Unit has been proceeding recently relates to the extension of the above System. Several countries have already started working on more elaborate systems showing among other things input-output tables, national balance sheets, purchases and sales of financial assets, etc. Since these developments are likely to spread to other countries it seems useful to attempt, at an early stage, to assist uniformity in the compilation and presentation of these data (even if existing knowledge about the potential uses of these estimates imposes a limit to the standardization that is possible and desirable), and also to make available to countries which are taking up work on these problems the experience gained in other countries. As regards input-output analysis, reference may be made to empirical work in the United States,[1] Denmark[2] and the Netherlands[3] and to a recent paper on the relationship of this information to the national accounts.[4] In the matter of balance sheets for countries or for large sectors, recent studies have appeared in the United States[5] and in the Netherlands.[6]

[1] W. W. Leontief, *The Structure of American Economy, 1919–1939*, 2nd edition, 1951.

[2] Nationalproduktet og Nationalindkomsten 1930–46, *Statistiske Meddelelser* 4–129–5, 1948. Also Nationalproduktet og Nationalinkomsten 1946–49, *Statistiske Meddelelser* 4–140–2, 1951.

[3] De Nationale Jaarrekeningen 1948, *Statistiche en Econometrische Onderzoekingen*, Vol. 6, No. 1, 1951, pp. 38–43.

[4] Richard Stone and J. E. G. Utting, *Input-Output Relations*, 1953. A volume containing papers delivered at a Conference on Input-Output Relations held at Driebergen, the Netherlands, September 1950, under the auspices of the Netherlands Economic Institute.

[5] *Studies in Income and Wealth*, Vol. 12, N.B.E.R., New York, 1950. This volume is devoted entirely to papers dealing with various aspects of the measurement of wealth.

[6] H. Rijken van Olst, B. Korn and C. A. Oomens, Het Verbund Tussen de Nationale Balans en het Stelsel der Nationale Jaarekeningen, *Statistische und Econometrische Onderzoekingen*, Vol. 5, No. 3, 1950, pp. 107–15.

A short critique of the latter work has been made by F. Sewell Bray,[1] and a recent study by accountants and economists in the United Kingdom which may be useful for conceptual and terminological purposes has also appeared.[2]

As regards adjustment for price changes very little work has so far been done at the Unit beyond the brief examination of deflation methods needed for the country studies and some calculations aimed at reducing the national incomes of the Participating Countries to a common currency. It is intended in the near future to make a more searching examination of within-country deflation methods and in particular to attempt to discover the probable biases introduced by the short-cut methods which are still much in use.

[1] F. Sewell Bray, A National Balance Sheet, *Accounting Research*, Vol. 2, No. 3, July 1951, pp. 279–300.

[2] *Some Accounting Terms and Concepts*, Cambridge University Press, 1951. This is a report of a Joint Exploratory Committee appointed by the Institute of Chartered Accountants in England and by the National Institute of Economic and Social Research.

5

INTERNATIONAL COMPARISONS OF NATIONAL ACCOUNTS IN ECONOMIC ANALYSIS

by Tibor Barna

I. INTRODUCTION

THE national income estimates of the mercantilist economists and their successors were put forward as part of an economic argument and as such served primarily as tools of economic analysis. In the last twenty years or so an enormous expansion, both extensive and intensive, has taken place in the production of national income estimates. The intensive expansion of the estimates, on both sides of the Atlantic, involved the creation of specialized studies and specialized students, and for this reason the connection between the preparation of estimates and their use in economic analysis became more remote. At the same time the extensive expansion spread to the economically less developed countries of the world, where statisticians often adopted criteria and techniques imported from abroad without considering their suitability in relation to native conditions.

As national income estimates became elaborated in the form of national or social accounts, the emphasis shifted heavily in favour of the formal criteria of accounting as against the economic significance of the concepts used. The presentation of estimates in the form of accounts which are in balance was a very welcome, though not a revolutionary, development. These accounts focused attention on the logical coherence of the set of definitions used, for instance the saving-investment identity, but they may have left a mistaken impression on many minds. No matter what definition one adopts for particular items, the accounts can be made to balance, provided that the definitions adopted for other items are consistent. Thus the accounts can bring no answer to age-old questions, such as the principle of valuation of farmers' own consumption, and these basic questions were pushed into the background by the novelty of the method of presenting the estimates.

In recent years attempts were made to present national accounts for different countries on a uniform basis. This was done by the adoption of international conventions – almost exclusively following the Anglo-American procedure – which

laid down in the formal accounting sense the position and interrelation of the various components of national income. No attempt was made to examine whether the economic significance of a particular item was in all countries the same. There is no reason to assume that this is so; it is conceivable, for instance, that the incidence of employers' contribution to social insurance falls on workers in one country (that is, it should be regarded as a direct tax) but is shifted to consumers in another (that is, it should be regarded as an indirect tax).

Instead of concentrating attention on the uniformity of accounting procedures, one might develop such definitions of the national income and its components that the concepts adopted should be suitable for the same purposes of economic analysis and planning in different countries. As the institutional framework of different countries is not the same, the uniformity of what might be called the operational definitions will result in variations in the accounting definitions. The purpose of the present paper is to comment on some of the institutional and structural differences between countries which make international comparisons difficult.[1] The problem exists even if comment is confined to European countries between which institutional differences are less sharp than between different continents of the world.

The next section contains comments on the concept of the national income, the third section on the place of public finance items, the fourth section on structural differences in price-relatives, and the last on the use made of estimates showing the allocation of resources.

II. THE CONCEPT OF NATIONAL INCOME

At present, European countries follow at least two different definitions of the national income in spite of the unanimous recommendation of the United Nations experts. The western European countries prepare estimates on the basis of the concept which has been in use for some time in the United Kingdom and the United States. It should be pointed out, however, that important western European countries, notably France, western Germany and Italy, although they may submit estimates on an

[1] Similar qualifications apply to comparisons for any given country over long periods during which the institutional and structural framework may have changed.

internationally comparable basis, for their own purposes continue to use concepts which differ from the Anglo-American definition, mainly in the treatment of the government sector. On the other hand, in the Soviet Union and in the eastern European countries under Soviet influence, a definition of the national income has been adopted which is claimed to be based on the writings of Marx and to be fundamentally different from that adopted in western countries.

In a purely formal sense, the Anglo-American and the Soviet concepts are similar insofar as both include incomes which emerge in the process of production, but exclude incomes which arise as the national income is being redistributed between individuals. The difference between the two concepts lies in the fact that in the Soviet Union 'production' is more narrowly defined, being generally (but not completely) confined to the production of physical commodities, to the exclusion of the production of services. Historically the difference in the practice of European countries in defining the national income is of long-standing origin. Already before the First World War the national income estimates for Austria-Hungary, of which the best known are those by Feller, excluded governmental, professional, and personal services. With some variation the successor states of Austria-Hungary have largely followed this tradition and consequently the change-over to the Soviet definition was quantitatively small; it was estimated in Yugoslavia, for instance, that the adoption of the Soviet concept involved a reduction of 4 per cent only in the national income estimates as made previously.

It has been shown by students of economic thought that the definition of national income by Marx was taken over from Adam Smith. Although Smith's ideas may now be considered out of date, insofar as he did not regard as productive what are now called the tertiary industries, the definition of national income used by him was the one most suitable for his analysis. That analysis was concerned with the rising capitalist society of the period and for this reason the concept of national income adopted embraced the area of economic activity which was organized along capitalist principles, and left out sectors of the economy not so organized.[1]

[1] Cf. R. L. Meek, Physiocracy and Classicism in Britain, *Economic Journal*, March 1951, p. 33.

If the national income estimates of the Soviet Union are closely examined, two conclusions seem to emerge. One is that in practice the definition has moved a long way from that prescribed by Marx, and the other is that the present practice can be consistently justified with reference to the requirements of Soviet administration, without recourse to the arguments of the classical economists. The national income of the Soviet Union includes income arising from the production and distribution of commodities, that is, income generated by agriculture, mining, manufacturing, transport, and the distributive trades. All activities which are connected with physical commodities are included: restaurants, at any rate of a certain type, are included since they distribute meals; various banking and financial institutions serving industry are also included, and to a large extent governmental agencies which are engaged in the direction of industry are included in the output of the relevant branches of industry. Further, the definition of what constitutes a physical commodity is not very strict and appears to depend on the organization of production rather than on its results. For instance, machine laundries are included because they use capital equipment and because they utilize the principle of division of labour. Lastly, because of differences in the organization of society, it so happens that a larger proportion than in western countries of professional workers, such as doctors or nurses, is attached to industry and agriculture, and their income appears to be included in the value of net output of industry. As a result of these refinements the quantitative difference between the Anglo-American and the Soviet concept is not so great as it might be supposed on purely theoretical grounds. In Poland, for example, it was officially stated that the adoption of the Soviet concept meant a reduction of about 10 per cent in the value of national income, though admittedly this proportion might be higher in economically more developed countries.

One can argue that the Soviet concept includes only items the maximum production of which is the aim of Soviet society. In that case the concepts used by different societies are not reconcilable and all international comparisons may seem pointless. Alternatively, one can examine the operational significance instead of the abstract concept of national income. Since the size of, and changes in, the national income are a guide for policy-makers, the concept of national income ought to include

activities which are within the area of interest of policy-makers, and not activities outside that area. In a country which is economically mature, as for instance the United Kingdom, the distribution of resources is relatively in equilibrium in the sense that under the existing distribution of incomes returns to factors of production in agriculture, manufacturing, and personal services, are approximately equal. This is not necessarily the case of a country which is not fully industrialized, as manpower could be better distributed if more capital were available. In such a country the policy-maker would be interested only in the production and distribution of commodities for which capital is required, and would assume that the supply of personal services could look after itself. His viewpoint is very much the same as that of Adam Smith: he is interested in the area of capitalistic production, that is, branches of the economy which require capital, and not so much in the redistribution of the national income between consumers, as defined by him. The size of the national income depends on objective factors, such as the state of technology and the rate of investment, whilst the redistribution of incomes depends on the behaviour of consumers. If consumers decide, for instance, to spend a higher proportion of their income on personal services, with a given amount of commodity production the national income of the Soviet Union would remain unchanged, but that of the United Kingdom would increase. The major difference in the economic structure of these countries is that in one instance certain branches of the economy operate practically without any capital, and in the other industrialization has pervaded the economy to such an extent that even personal services are using capital equipment, or at any rate those engaged in personal services could find alternative occupation in other branches of the economy.

A very important omission from the national income estimates of most countries is the value of housewives' services, in spite of the fact that this makes the concept less useful as a measure of economic welfare. The reason for excluding housewives' services, apart from the difficulties in measuring their value, is that the policy-maker is not interested in the distribution of family income between members of the family. In the seventeenth century, when domestic servants were regarded as part of the family, the estimates of Gregory King excluded the income of domestic servants, and this exclusion can be justified

by very similar reasoning. One might even be interested in the welfare of the working classes only, in which case it is of secondary importance to know how incomes are redistributed between the other classes. This criterion is likely to supply the answer to the problem of the late Lord Stamp whether the national income should be increased when the famous opera singer has an operation and the famous surgeon who performs it then goes more often to the opera.[1]

To put the matter in more general terms, it is sometimes possible to divide the economy into several sectors in such a way that the interdependence between the sectors is only along one or two channels. In that case it is possible to concentrate attention on the major part of the economy in which one is interested and assume that transactions within the sectors excluded have no significant influence on that part of the economy. Thus in a partly capitalistic and partly pre-capitalistic society, transactions within the pre-capitalistic and consuming sectors have no influence on the capitalistic sector, on the assumption that likely changes in the distribution of incomes can have only a negligible effect on the structure of capitalistic production. Similarly, housewives' services can be excluded on the assumption that likely changes in the distribution of incomes within the family have no significant influence on the pattern of production. Thus what is included in, and what is excluded from, the national income is not arbitrarily decided, but is conditioned by the structure of the economy and the pattern of society, which may vary from place to place and from time to time. An evident illustration is the fact that most national income estimates exclude illegal earnings, but what is legal and what is illegal is not the same in all countries and at all times.

In spite of the qualifications made in this section, it would appear that national income comparisons between European countries should be possible, since the quantitative deviation between the different concepts adopted is not very large. It would be a pity, however, if countries even less industrialized than those in eastern Europe, such as Greece, Portugal or Turkey, were persuaded to adopt the concepts used in the western countries, since incomes generated by a number of activities are not only almost impossible to measure there with

[1] It is, however, a condition of the problem that both surgeons and operas should have excess capacity.

any degree of accuracy, but, as argued above, it would be also unnecessary to do so.

III. PUBLIC FINANCE ITEMS

As governments publish detailed accounts of their own financial transactions, it may appear easy to fit public finance items into standardized patterns, taking the description of the various items as the guide for classification. Yet the validity of a formalistic approach to national accounting appears more questionable in the field of public finance than elsewhere. Here the impact of institutional differences is sufficiently important to lead to a reconsideration of many of the national practices of the United Kingdom or the United States before adopting them as the standard for other countries; in particular, it cannot be assumed without investigation that the economic significance of items described by the same name is the same in all countries.

With the extension of government activity into industry, the separation of the government sector from the rest of the economy became more difficult. So long as only the post office was in state ownership, it could be argued whether it was a public service or an industry: with coal-mining, transport or iron and steel in public ownership it is evident that governmental activities as such ought to be separated from the public sector of industry. In certain countries, as in the United Kingdom, industries in public and private ownership can be neatly separated, but elsewhere ownership is too complex to make this possible. In Italy and Spain, for instance, the government has a financial interest in industry through special institutions, and here the share of the public sector in industry, or in capital formation, can be obtained on a number of alternative definitions. In the Soviet Union and eastern European countries, on the other hand, public ownership of industry is so extensive that it is problematical whether any meaning can be attached to concepts to which one is accustomed in western countries, such as the differentiation of turnover taxes from industrial profits.

Similarly, the extension of public expenditure for social purposes has given rise to problems, the answer to which does not appear to be the same in all countries. In particular, what is regarded as transfer expenditure or subsidy, as distinct from government purchases of goods and services, cannot be uniquely

defined but must depend on current social opinion regarding these expenditures. Only on this basis is it possible to explain, for instance, the British practice of regarding the pensions of regular soldiers as part of the national income, and the pensions of war-time conscripts as transfer income. Also, in France the government aid to the Paris Opera and similar institutions is regarded as subsidy, but in Britain government expenditure on the British Museum and other institutions is taken as part of government expenditure on goods and services. It is possible that these differences are simply due to arbitrary decisions having been made in the past as regards the classification of items, but they are more likely to be attributable to the underlying institutional differences in the two countries in the field of administration. The most important differences are of more recent origin, due to the development of social security systems. The legal position of these systems varies from country to country: at one extreme they may have the nature of insurance proper and at the other they may be completely integrated in the system of public finance. For instance, social insurance funds may or may not be set aside, and even if they are set aside they may or may not be regarded as independent from other assets of the government. It would not be wrong to suggest that the various accounting practices adopted in different countries are influenced by the institutional framework of social security systems.

The most conspicuous deficiency of the accounting approach concerns the classification of taxes. Since the earliest days economists paid great attention to analysing the incidence of taxation, but current work on national income estimates almost completely ignores this. The major distinction between direct and indirect taxes, for example, is based entirely on formal criteria, and no investigation is made whether direct and indirect taxes are in fact borne by those who were assumed to pay them. Insofar as the validity of this assumption cannot be supported, there is not much point in making a statistical distinction between the two categories of taxes. If one examines the relationship of wages to national income it is not possible to arrive at valid conclusions without having made a correct distinction between direct and indirect taxes. The incidence of employers' contribution to social insurance, for instance, may be on the worker in one country, on profits in another, and on prices in

general in a third. Reasoning based on first principles is of little help and the particular conditions of each country ought to be separately investigated. It would not be wrong to suppose that the scale of these contributions itself has a bearing on the issue. In France and Italy, these contributions are high in relation to wages because almost the whole of social security is financed in this way and it is likely that these contributions, at any rate partly, are analogous to wages. In Britain, on the other hand, where these contributions are relatively low and at a flat rate, it is more likely that they are paid out of profits or passed on to consumers by way of higher prices.

To mention a more general problem, in the United Kingdom or the United States national accounting, as all accounting, is based on accruals of credits and liabilities, and not on actual cash receipts and payments. This method particularly affects the financial relationship between the public and the private sector. The procedure adopted in these countries assumes the existence of adequate monetary institutions which look after the short-run finance of the government. In countries which have no such institutions, partly because they are not sufficiently developed and partly because they are constantly on the verge of inflation, the distinction between cash transactions on the one hand, and accruals of credits and liabilities on the other hand, is not very useful. The timing of government expenditure and lags in tax receipts in these countries have an immediate impact on the economy. The best-known example is Italy, where customarily contractors do not get paid immediately by the government but have to have recourse to their own financial resources. In assessing the importance of government expenditure one must decide whether to take into account the value of cash payments to the contractor or the value of the contract granted to him, and this decision must obviously depend on whether the pattern of financial institutions existing is such as to exclude the possibility of further repercussions on the economy. In Britain the repayment of public debt is not considered as part of national income analysis as it is assumed that the investor will hold one piece of paper instead of another, with no consequence on consumption or investment. In France, however, repayment of public debt may have the same inflationary consequences as government current expenditure and, in fact, attempts are made to finance such repayments out of taxation.

IV. THE STRUCTURE OF PRICES

Apart from the problems of definition, difficulties arise when inter-country comparisons of national income are made, because the structure of prices varies from country to country. Of course, without differences in price relatives no difficulties of comparison would arise, since it is the existence of these differences which gives rise to the index number problem. Some of these differences in price relatives are due to differences in local conditions, such as the fact that in Italy rice is cheap relatively to wheat, and in England wheat relatively to rice. But, apart from that, one can find structural differences in prices which make the interpretation of the results of any international comparison somewhat doubtful. By structural differences in prices it is understood that the system of prices is connected in some way with the stage of economic development of the country, or with the pattern of institutions, and for this reason the difficulties which are discussed here are relevant when comparisons are made between countries at different stages of development or following different institutional patterns.

An attempt was made, for example, to evaluate the national income of European countries in terms of dollars for a number of years.[1] For the sake of simplicity it is sufficient to consider two sectors only, that producing commodities and that producing services. It was evident that the rates of exchange applicable to the two sectors were not the same and the gap between them was correlated with the degree of industrialization insofar as the price of services was relatively cheap in the poorer non-industrial countries. As a result of this fact, when the national income was converted into dollars that of the poorer countries appeared to be unduly high in relation, for instance, to capital formation also expressed in dollars. As an alternative procedure the division of national income between commodity and service production was estimated for each country in terms of its own currency and the relevant proportions were applied to increase the estimated dollar value of commodity production to make an allowance for the production of services; this is identical to assuming that the same rate of exchange is applicable to both commodity and service production. Another difficulty with the use of total national income

[1] *Economic Survey of Europe in 1948*, U.N. Economic Commission for Europe, Geneva, 1949.

in terms of dollars was that the figures from year to year moved differently from individual countries' own estimates of their real income, since the two series are based respectively on dollar prices and national prices. Altogether it appeared that for certain practical purposes the dollar value of commodity production was a more meaningful concept than that of total national income.

In general terms it is possible to find two major causes for the difficulties discussed here. One is due to structural differences in productivity and incomes, and the other to government interference with the price system.

The international exchange of goods is expected to bring about certain uniformity in price relatives, subject to the qualifying influence of transport costs or monopolistic practices, but this uniformity applies only to commodities which are transportable and there is no reason to assume that a similar uniformity will cover the rest of the economy. Differences in price relatives for consumption and investment goods may be due to the fact that the distributive margins, which are much larger for consumption than for investment goods, differ from one country to another. The cost of building may also greatly differ from the cost of manufactured goods, since productivity in the building industry is not necessarily correlated with productivity in manufacturing. These differences are further reinforced by a tendency for wages in the building industry to be low in countries where agricultural wages are also relatively low. The quantitatively most important differentials, however, exist between the prices of physical commodities and those of services. Since wages tend to be equal in different branches of the economy, as industrial productivity increases the price of manufactured goods falls relatively to services, and consequently countries at different stages of industrial development would show systematic divergences between the prices of commodities and services. This argument applies primarily to pure services only, insofar as such services exist, such as doctors' or teachers' services. Whereas productivity in manufacturing industry varies greatly from country to country, there is no reason to assume that significant differences would exist in the 'productivity' of doctors or teachers.[1]

[1] It should be noted, however, that insofar as the application of machinery is possible one finds that in the more developed countries productivity in services is also higher, and, in fact, often prices of such services, such as laundry or the processing of photographs, are lower in the more industrialized countries where

The intervention of the government may also alter the structure of prices in a systematic manner. Restrictions on international trade generally increase the prices of consumption goods much more than the prices of investment goods. More important, taxation of commodities alters the structure of prices and such taxes invariably fall much more heavily on consumption than on investment. This consideration may be particularly important in the case of the Soviet Union and eastern European countries which rely heavily on the turnover tax as against the use of the income tax.

V. THE ALLOCATION OF RESOURCES

Lastly, the difficulties encountered in the interpretation of estimates of the allocation of resources should be mentioned. The analysis of national income centres on its allocation between consumption, both by households and by public authorities, capital formation and the balance of payments, and its purpose is to present to policy-makers alternative possibilities in order that they should be able to bring in measures to promote fuller employment or to avoid inflation. The estimates aim at measuring the excess or deficiency of claims on resources over the supply of resources, and this excess or deficiency is to be eliminated by policy measures. Such techniques were originally applied during the war and since in the United Kingdom, the United States, the Scandinavian countries and the Netherlands, and again there is no reason to assume that they are applicable to other countries where conditions may be different.

This type of national income analysis was developed under the influence of the economic doctrines of Keynes, and made particular use of the identity of saving and investment, and of the theory of the multiplier. The Keynesian system is based on certain assumptions, whether they are explicitly stated or not: it applies under conditions of general unemployment and it presupposes the existence of the financial institutions which are to be found in the United States or the United Kingdom. There is no inherent reason to assume that the same theory would apply in different surroundings and hence there is no reason to adopt the same set of statistical tools in all conditions.

such services have been mechanized. For this reason, the customary procedure of assuming that the volume of services produced is proportional to employment in service industries may contain certain dangers.

The type of analysis mentioned follows Keynesian doctrine insofar as its usefulness depends on the fact that expenditure out of a given income can be objectively determined, in the simplest case as a linear function of income; in other words, propensities to consume or to save are taken as given data which are unlikely to alter within the period considered. On the other hand, investment in fixed capital or alternatively all non-consumption expenditure, is taken as the dominant economic variable, which is determined without reference to decisions to save. It is doubtful whether these assumptions were valid in recent years in a number of European countries, as for example France and Italy. In these countries one experienced shifts in demand which could be explained by psychological factors rather than by changes in income and prices, and one also found that investment in fixed capital and also government expenditure was very much directly dependent on ways and means of financing it. One may also come to the conclusion that the dominant factor in recent economic fluctuations in these countries was not the change in investment in fixed capital but the movement in stocks. In such circumstances more attention ought to be paid to variables other than those used in the Keynesian theory and efforts ought to be made to measure more accurately movements in these variables, such as stocks.

The Keynesian system further assumes that sufficient excess capacity exists all round to make a general industrial expansion possible without encountering in some sectors of the economy sharp rises in costs and prices. In terms of national income analysis this assumption implies that it should be possible to reallocate resources between consumption and investment in financial terms without considering supply difficulties. During the war, however, resource allocation was determined mainly in terms of physical quantities and financial resources were allocated subsequently, so as to support the proposed pattern of the economy, and hence the rôle of national income analysis was much more limited. Similar limitations would apply in countries which aim at industrial development and where the obstacles to expansion are mainly physical; here achievement of monetary equilibrium comes only in the second place following physical planning. It may be argued, therefore, that under certain conditions it would be wrong to give priority to the development of national income analysis instead of to an analysis of

economic trends based on a collection of statistics relating to prices and quantities, which is a much simpler method.

VI. CONCLUSION

The above discussion touched only on some problems that emerged in the practical use of national income estimates in the course of economic analysis. Their common element was that they pointed to difficulties which were attributable to national differences in the framework of institutions or in stages of economic development. To overcome these difficulties it is necessary for estimators of national income to study more closely the purposes for which these estimates are used, and also for users of these estimates to be more familiar with their exact content. It would appear that one may have to reconsider whether some of the concepts habitually used are equally applicable in all places and at all times. In particular, the economically less developed countries should proceed cautiously in introducing methods used elsewhere and should consider carefully their own individual circumstances and problems.

6

CONCEPTS OF INCOME AND WELFARE—IN ADVANCED AND UNDER-DEVELOPED SOCIETIES—WITH SPECIAL REFERENCE TO THE INTERCOMPARABILITY OF NATIONAL INCOME AGGREGATES[1]

by S. Herbert Frankel

I. DIFFERENCES IN SOCIAL OBJECTIVES AND IDEALS

In this paper I propose to discuss certain conceptual problems concerning the meaning of income and product in under-developed countries which have confronted investigators endeavouring to compare national income aggregates of advanced societies with similar calculations attempted for so-called under-developed or pre-industrial communities.

At the outset I wish to record the benefit I have received from the work of Professor Simon Kuznets on this question, particularly from his valuable paper on 'National Income and Industrial Structure'.[2] This paper exhibits the impasse which confronts national income calculators when they endeavour to compare income aggregates for developed and under-developed societies – or as Professor Kuznets calls them, 'industrial and pre-industrial' countries; by which he denotes, 'on the one hand, an economy dominated by business enterprises, using advanced industrial techniques and ordinarily with a large proportion of its population in large cities; and, on the other hand, an economy in which a large part of production is within the family and rural community, a minor share of resources is devoted to advanced industrial production and a minor part of its population lives in cities'.

The crux of the difficulty of definition arises from the fact that

[1] This paper originally formed part of a larger one submitted to the 1951 meeting of the International Association for Research in Income and Wealth. In the course of writing the paper I was led beyond the strict confines of the subject set for discussion at the conference and found myself dealing with certain semantic and philosophical issues. This portion of the paper it was felt could be more conveniently published separately. (Cf. Psychic and Accounting Concepts of Income and Welfare, *Oxford Economic Papers - 1952.*) The remaining portion of the original paper which is here presented has therefore been suitably revised. Summary references to the original paper have been included and certain new material has been incorporated.

[2] Read before the Washington Meeting of the Econometric Society in September 1947; *Econometrica*, Vol. 17, Supplement, July 1949.

as between, and even within, developed and under-developed societies there are great differences in the range of activities to which a highly refined accounting concept of income can be applied.

The problem with which I am here concerned, however, arises not merely as a result of different technical methods of organizing production – for example, in business enterprises and market economies as opposed to authoritarian, family or subsistence economies – but has its origin rather in the different objectives and ideals which consciously or unconsciously dominate the communities whose individual and social economic activities are being compared. In the last resort it is these historical and traditional factors, and not merely the state of technique and organization, which are the basic cause of differences in the nature and form of the 'income' produced by them.

The creation of income takes place within a social framework and a social situation. What 'income' is and how it is valued is determined by the social circumstances and surroundings in which the individual finds himself. Thus, the attempt by the individual to obtain what we may call 'income' is an attempt to achieve a social purpose. It is not merely, if at all, to create a set of individual values or obtain an 'individual income stream'. It is not the solo act of a Robinson Crusoe marooned on an island; even Robinson Crusoe cannot be regarded as acting merely according to the dictates of his own appetites, for he brought with him from the society to which he belonged not only a stock of capital goods but, far more important, a set of values, ideals and objectives.

The creation of 'income' is of a piece with social communication; our actions are not determined in isolation but depend also on the influence we wish to exert upon others and which their activities in turn exert upon us. Just as physical production depends on social co-operation so the symbolism according to which it is regulated is socially determined.

To take an imaginary example; in a community of absolute pagans, he that wishes to build a temple to the deity would be engaged upon a social act of persuasion, and he could not engage upon it unless his views had gained sufficient acceptance to bring about social co-operation; therefore to pursue an ideal

in isolation is to cut oneself off from the community and from social life. The 'satisfaction' derived from an individual's acts or thoughts in complete isolation has no social significance, and there is no way of measuring it.

The paramount influence of social situations is well illustrated by the experience of colonial administrators. Individual Africans, for example, who have attained to a high standard of technical proficiency when trained as agriculturists in a modern environment have, on returning to their own tribal community, 'forgotten' or abstained from applying what they have learnt. They break off contact with the market economy because they are afraid of being isolated from or incurring the ill-will of their fellows should they practice modern methods. They are happier to use again the methods of their forefathers and to be at one with the objectives of the community to which they again desire to belong.

What is the significance of this type of behaviour? Is it not the renunciation by such people of the objectives and ideals which dominate, or are assumed to dominate, advanced societies, and in particular of the concept of income in which they are expressed, such as the ideal of maximizing the net flow of individual money income? And is it not a renunciation of the accounting symbolism on which the European economy in the West is generally based?

It is this symbolism which expresses the system of value coefficients which, as Ragnar Frisch has shown,[1] must be established by 'some sort of convention' which in itself is an axiomatic datum without which the sectional – or national –

[1] As an example of such a system of value coefficients he writes:

'We may take the market prices of the goods. We may specify the concept of market prices further by saying that it should be prices actually paid by the buyer. With this specification – and with certain supplementary conventions for such items as the product of housewives' work or other products of the household – it will in most actual cases be clearly defined what sums should go into the basic magnitudes. This definition becomes a meaningful one because in order to define the value concept used we have had recourse to some criterion outside the ecocirc-system itself. We have established the definition by referring to the concrete facts surrounding each individual payment. We may, if we wish, establish the value definition by some other sort of convention, for instance, by an elaborate system of social valuations or socially determined priority figures, etc., but in all cases we must postulate some system of value coefficients before the basic concepts get a meaning.' *Attempt at Clarification of Certain National Income Concepts*, Stencil Memo, 8th October 1949, University Institute of Economics, Oslo.

accounting streams with which we may be concerned have no meaning. As he rightly stresses, all the definitional equations of the ecocirc-system hold good 'whatever the system of value coefficients used, *provided only that the same system is applied throughout* (my italics). Our problem, however, arises precisely because we are dealing with different value systems and conventions. And thus the concept of abstract welfare has and is being used as a bridge, but in my opinion an inadequate bridge between different welfare systems.

Mr. Colin Clark, criticizing the view of some modern theoretical economists that it is impossible to compare the level of income between two communities,[1] argues that exponents of this view, 'do not realize what an intellectual anarchy they will let loose if their theories are adopted'. 'Deprive economics of the concept of welfare,' he writes, 'and what have you left? Nothing; except possibly the theory of the trade cycle where all values may be capable of expression in money terms without the introduction of the concept of welfare.' He does not hesitate to make 'comparisons of economic welfare of different times, places, and groups of people', and writes:

> To compare, for instance, the real value of $0.795 produced per hour worked in U.S.A. in 1929, and 1.28 Rm. or $0.305 at par of exchange produced per hour worked in Germany in the same year, we must take account of the actual quantities of goods and services produced, or, in other words, what the money will buy. The average American over that period spent his income in a certain way, purchasing certain quantities of goods and services. If he had gone to Germany and had set out to purchase exactly the same goods and services, he would have found that they were 0.9 per cent cheaper in the aggregate than in his own country. The German with his income purchased certain goods and services, by no means in the same proportion as the American. He spent much less of his income on motor cars and rent, and much more on food.
>
> The German going to America and purchasing the goods and services which he was accustomed to consume would find that they were 19.8 per cent dearer. In comparing the real value of incomes in the two countries we must, therefore, allow something between 19.8 and 0.9 per cent for the difference in purchasing power of money.

[1] C. Colin Clark, *The Conditions of Economic Progress*, 2nd edition, London, Macmillan, 1951, pp. 16–17.

He then discusses Fisher's and Pigou's well-known formulae for doing this.

This example, I suggest, exposes the hidden assumption on which Colin Clark is working; namely, that either an American in Germany or a German in America could spend his income *as if* the fact that he was from a different society would not affect the purposes for which he desires or spends income. It may of course be argued that the social objectives of Germans and Americans are, on the whole, similar; that a German can adapt himself relatively easily to the American way of life when he goes to America and vice versa. But when comparing developed and under-developed, or industrial and pre-industrial, societies this argument is quite unreal. An American prepared to live in China as the Chinese do might be able to obtain specific goods and services more cheaply than these could be obtained in America. But if he wishes to live there as an American the position might be quite different. And the real question – which Colin Clark does not face – is: Are we comparing 'income' in terms of the American or the Chinese *way of life* when we make such calculations? For, obviously, the experience of isolated, 'atomized' individuals living in foreign communities is of no comparative interest whatsoever.

Professor Kuznets no doubt had this point in mind when he quoted Colin Clark's figures showing that more than half the population of pre-industrial countries receive a per capita income of less than $40 international units, and asked: 'Could people live in the United States during 1925–34 for several years on an income substantially below $40 per capita?' 'The answer,' he thought, 'would be ''yes'', if they were sufficiently wealthy to have lots of possessions to sell, sufficiently lucky to have rich relations or sufficiently bold to rob other people. The one-third to one-half of the pre-industrial population of the world would scarcely be in that position; and if we assume that all they have produced and could consume per capita was less than 40 international units for several years, the conclusion would be all would be dead by now.' He is led to infer, therefore, '(a) either that the estimates, even after the customary adjustments for comparability with industrial countries, are still deficient in omitting many goods produced in pre-industrial countries; or (b) in fact the whole complex of goods produced and consumed is so different that we cannot establish any

equivalence of the type represented by Mr. Clark's international units.'[1]

II. LIMITATIONS OF THE INCOME CONCEPT

It is the thesis of this paper that these difficulties of comparison are due on the one hand to a fundamental dichotomy in the meaning which we ascribe to national income aggregates in advanced money economies, and on the other hand to unwarranted assumptions concerning the nature and measurability of 'income' in the less developed societies with which we endeavour to make, or enforce, national income comparisons. First it is necessary to draw attention to the peculiar concept of income which governs what might be called the symbolism of economic activity in economic literature (though not necessarily always in the minds of the real economic actors themselves) in the advanced and complex money economies of the modern world.

That symbolism consists in the belief that the members of such societies are engaged in creating, and strive to increase, and indeed to maximize, certain individual abstract psychological entities called utilities, or satisfactions which reside in, or take the form of individual states of consciousness. According to this view income which an individual receives is in the last resort a mental experience – an event in the mind of the individual concerned. This mental experience, it is alleged, cannot be measured or observed directly, but changes in it can be said to be indicated and measured by changes in the publicly and recorded valuations of those goods and services which are

[1] Professor Kuznets adds: 'The form in which the question was raised – how it is possible for a large proportion of the population in pre-industrial countries to survive on an income that produced, for several years, less than the equivalent of $40 per year – obviously reflects my bias as a member of an industrial society. Personal experience and observation tell me that such an annual product is well below the starvation level. But were I a member of a pre-industrial society I might well have asked how it is possible for the majority of the population in the United States to dispose of as much as $500 per year, or whatever its equivalent would be in international units of rupees or yuan. Especially, on being told that of this huge income less than 10 per cent is saved for net additions to capital stock, I might ask how the population manages to consume so much – given the limited amount of food one can eat, clothes one can wear, or houses one can inhabit. And a suspicion similar to that voiced above could be entertained, namely, that these income figures for industrial countries must include many categories of items that are *not* included in income as ordinarily conceived in pre-industrial countries; and that the whole pattern of consumption and living in industrial countries is so different as to explain the ease with which these *huge quantities* of goods are produced and especially consumed.'

exchanged against, or can be expressed in terms of, money. It is my thesis that this view of income as ultimately a psychological entity residing in the minds of individuals, changes in the magnitude of which entity can be reflected in national income aggregates, is fallacious. At this point, however, I merely wish to stress that even if this mental symbolism were to be found to be an accurate portrayal of reality in 'advanced' societies I would argue that it had little or no parallel in the social and economic life of most of the inhabitants of the 'under-developed' countries of the world. In the economically 'backward' communities economic activity cannot possibly be regarded as governed by highly refined individual choices, or abstract evaluations, directed towards increasing individual mental satisfactions. For the most part these peoples are engaged in narrow economic pursuits determined by the pressure of the environment from which they have consciously, or unconsciously, as yet learned only how to wring a precarious existence in accordance with those traditional social and economic precepts to which they cling for guidance. To speak in their case of the creation of income in a monetary, a psychological, or even an individual sense is to apply a foreign symbolism to express or to account for activities which are not conducted in terms of it, and cannot be expressed by it.

By far the greater part of the activities of such societies are directed to the production of goods and services to satisfy the 'concrete' needs of immediate or seasonal consumption; and not in any sense to the creation of 'rights' to goods and services or 'values' in the abstract: such as the right to an abstract stream of 'income' in an accounting or property sense. That is why we meet so frequently with the well-known phenomenon that, when particular goods or services in such communities are traded against money, production is not necessarily stimulated by higher prices for them, or by higher rewards to labour. On the contrary, higher prices may result in a falling off in effort and production because what stimulates the people concerned to effort is the achievement of particular limited purposes – purposes which are socially determined by custom and tradition. In such societies money is a 'good' among other goods which has limited uses. What money is, and the rôle it plays, is always an expression of the institutional arrangements of society as a whole – a truth often forgotten even in 'advanced' societies. The

accumulation of money, as for example in societies where the possession of it can do little to affect the willingness, or ability, of persons to alter traditional patterns of economic activity (as when, *inter alia*, it cannot be used to acquire land or property rights or other resources, or to attract labour to other than traditionally determined purposes), is of little use to the individual. It does not necessarily even yield him increased security, since this is subject to social forces which the possession of money does not necessarily control.

The main point which, I submit, emerges from an examination of economic activity in most under-developed societies is that these activities cannot be expressed adequately by highly abstract concepts of individual income in accounting or monetary terms. To attempt to do so is to do violence to the governing principles of social organization and evaluation in them – just as one would do violence to the values created and represented by family life if one were to try to express them only in terms of the 'income' yielded to each of its members: for its mutual co-operant activity cannot be regarded as based only on the desire to magnify the individual satisfactions or utilities of each of its members, or their money income.

But even if (as is not the case) the *major* part of the activities of under-developed societies were, in fact, conducted on the basis of a highly complex accounting and monetary symbolism it would still, I believe, be fallacious to endeavour to compare income aggregates as between different societies. To make this attempt implies that the process of measuring the national income is something more than that strictly accounting procedure which, of necessity, can refer only to the accounts and value relationships set up within any one society. It implies that back and behind these objectively recorded accounting relations there is something else – some composite of abstract private values – which constitutes the ultimate satisfaction, or welfare, of all the individuals within a society. It implies that, although we cannot compare the different objective goods and services which flow from the greatly varying economic activities of different societies, we can, nevertheless, meaningfully compare the shadow-world of abstract private subjective values, which the consumption or possession of these goods and services is alleged to create in the minds of individuals. Thus it is implied that national income aggregates are comparable precisely be-

cause, in the last resort, these aggregates supposedly give rise to abstract ultimate values (e.g. experiences of satisfaction, or welfare) in the minds of individuals: abstract values which are dissociated from the accident of time and place, and from the social matrix in which everything else is so obviously, and so unavoidably, embedded.

It is my view that this whole concept of the national dividend as, on the one hand, consisting in a series of measurable events (goods and services) which, on the other hand, have a counterpart in, and throw light on, a second series of events in the states of consciousness, or minds of individuals, rests on a category mistake. It is one of those types of mistake which arise from representing facts 'as if they belong to one logical type or category . . . when they actually belong to another'. In the article previously referred to[1] I gave one of Professor Ryle's illustrations of such a mistake which is worth quoting here in full as follows:

> A foreigner visiting Oxford or Cambridge for the first time is shown a number of colleges, libraries, playing fields, museums, scientific departments and administrative offices. He then asks, 'But where is the University? I have seen where the members of the Colleges live, where the Registrar works, where the scientists experiment and the rest. But I have not yet seen the University in which reside the work the members of your University.' It has then to be explained to him that the University is not another collateral institution, some ulterior counterpart to the colleges, laboratories, and offices which he has seen. The University is just the way in which all that he has already seen is organized. When they are seen and when their co-ordination is understood, the University has been seen. His mistake lay in his innocent assumption that it was correct to speak of Christ Church, the Bodelian Library, the Ashmolean Museum, *and* the University, to speak, that is as if 'the University stood for an extra member of the class of which these other units are members. He was mistakenly allocating the University to the same category as that to which the other institutions belong.[2]

The point of this illustration is to direct attention to the fact that when we add up the 'net values' which society ascribes to

[1] Psychic and Accounting Concepts of Income and Welfare, *Oxford Economic Papers*, February, 1952.

[2] Gilbert Ryle, *The Concept of Mind*, Hutchinson's University Library, 1949, p. 16. I am greatly indebted not only to the book, but to Professor Ryle personally for valuable suggestions.

certain events or happenings (goods and services) we are simply measuring certain parts of the whole society's activities just as if we were describing different *parts* of the whole university. But it is as wrong to regard these goods and services as *causing* the welfare of society (as, for example, Pigou appears to have done)[1] as it would be to regard the different buildings as *causing* the university. The university is not the counterpart to its teachers and buildings; nor is society's welfare a *counterpart* of its goods and services.

In other words, when we have recorded an increase in the 'income' of a society by measuring certain goods and services we cannot logically regard this increase as indicating a further increase in something else called 'welfare', or collective 'satisfaction' or 'utility' allegedly being 'enjoyed' by the society. By definition we have already identified this 'welfare', and the like, in terms of the very goods and services which we have measured. The welfare of society is just the pattern in which *all* its activities are organized and when we 'measure' one part of those activities we cannot regard this part as yielding some counterpart of welfare elsewhere.

It is precisely because these welfare patterns in societies differ so widely and, as it were, determine what is regarded as 'income', that 'income' in one of them will be so different from, and incapable of comparison with, what is 'income' in another. The mere evaluation of goods and services designated as 'income' in the one, does not necessarily express or indicate anything which can be compared to them in the other – except these very goods and services themselves. The comparison of these, however, fails completely to indicate their relative importance in the value pattern of life and activity in the different societies of which they form a part. In other words, end products

[1] I have analysed what appear to me to be the logical shortcomings of Pigou's welfare concept in the article already referred to. Therein I have also compared it to Irving Fisher's concept of 'psychic income'. What is 'welfare' or 'economic welfare' to Pigou was 'psychic or enjoyment income' to Irving Fisher. The latter was at pains to equate 'ultimate income' to 'the psychic experience of the individual mind' – a *private process of observing* (and privately measuring) these *inner* events of enjoyment: the counterpart of real income – a counterpart located in the 'mind' of the observer. To Fisher it is as if, while eating my dinner, I am observing, recording or reporting to myself on the 'agreeable sensation' and experience of eating it; and it is as if I calculate or measure my *net* psychic income by not only continually observing, recording, and reporting on 'agreeable sensations' – if that is possible – but also by observing and reporting on accompanying disagreeable ones (such as those which Fisher calls the 'labour pains' involved in earning income), and deducting the latter from the former.

in the form of goods and services do not tell us the meaning which the society in question ascribes to their production, and to their use.

In one society a large part of the buildings of the government may house a gendarmerie used for the purpose of maintaining the people in slavery, in another society they may house an élite endeavouring to educate the people to freedom. How can one compare the 'income' of government servants in these two societies – or the net value of the building construction itself?

It is logically fallacious to try to evaluate economic activities in different societies for comparative purposes by valuing merely the end product of those activities. To do this is to overlook that the value of the product is but a part, and possibly a very insignificant part, of the activity which gives rise to it.

A certain African tribe lives entirely off the blood and milk of living cattle. The tribe despises all other activities than roaming with the cattle over wide pasture areas. There is no way of evaluating these peculiar end products (blood and milk) and comparing them with say the 'net value' of milk, or meat produced elsewhere. To this African society, living with its cattle is as important as the sustenance yielded by them. The activity and the end product are inseparably embedded together in its social status system, its habits, and its ways of thought, and so far nothing has weaned them away from this peculiar welfare pattern.

It follows, therefore, that attempts to 'impute' values to goods and services in an economically under-developed community, on the basis of assumed market values existing in a more advanced community in order to enable artificial comparisons of income aggregates between the two, is a highly questionable procedure. It is, indeed, difficult to see what meaning can be ascribed to statistical aggregates so obtained. To say, for example, that the 'income' from the production of maize in a Central African province which does not trade maize can, for comparative purposes, be calculated by 'imputing' the value of the same quantity of maize (or equivalent food products) in another society, is to force a comparison in which the term 'income' is no longer restricted to its accounting sense but carries with it a connotation like that of psychic income which I have been criticizing. For the fundamental fact remains that we do not know the relation of the 'value of maize' in such a society to the rest of its system of values.

III. RAPID CHANGES IN ENVIRONMENT

It is not only the fact that a very limited range of the activities of pre-industrial societies may be covered by accounting symbolisms of any kind that makes comparison with more advanced societies difficult. There is the further important consideration that the pre-industrial societies are, in most cases, undergoing rapid transition. They are in a process of disintegration; rapid changes are occurring in their way of life and in their social value systems; members of the society are becoming attached to modern money economies in which the value systems are entirely different. How can one compare the income of 'individuals' or 'groups' at different times when they have been subject to such changes? How can one attempt to assess whether the pre-industrial community is 'better off' when, as in South Africa, for example, it has undergone a rapid process of urbanization, and has been integrated into a modern economy in a quite different social framework?

As I have endeavoured to show, the very question is in itself illegitimate. The income which we record for such groups in the modern environment portrays only the new objectively recorded relations between them and others. But such statistical and accounting records tell us nothing of interest concerning the value of the system which has been destroyed as compared with the one which has taken its place.

In my opinion, frank recognition of the limitations inherent in any system of national income calculations or social accounts would have beneficial consequences; it would focus attention on the fact that it is illegitimate to make the *a priori* assumption that an increase in the aggregates arrived at by such calculations have, in themselves, any significance for social action. It would emphasize, on the contrary, that any system of social accounts is but a device for portraying limited relations within the field of social action covered by them, and that the activities so covered may have relatively little importance in relation to social objectives as a whole. Thus one of the main tasks which now confront economists, statisticians, and sociologists emerges more clearly, namely, to determine which factors constitute the welfare pattern – rather than to stop short at comparing symbols which do not adequately portray it. Only thus will it be possible to clarify the relation between activities which can and

those which cannot be subsumed under a system of accounts. Only in this way can a system of accounts be brought into meaningful relation with the welfare system and pattern of society as a whole.

This is of particular importance in under-developed or pre-industrial societies undergoing rapid change, for such change, signifying as it does a change not only in technical organization but in value systems, lays upon the society in question the urgent burden of experimentation as to the new forms or ways of life which must take the place of those habit patterns in which welfare was previously incorporated. The social system of accounts or body of statistical data, to be meaningful, must be closely integrated with detailed studies yielding wider economic and sociological data for specific purposes, designed to reflect the changing social framework, as well as the activities it incorporates. Such a statistical system must at all times aim mainly at portraying certain limited economic and social relationships, covering relatively brief periods of time, and intended to clarify the relationships themselves. No system of accounts and no statistical calculations can in themselves yield aggregates which will obviate the need for detailed individual and social decision as to the activities which society should pursue or the social framework within which they should be conducted.

Indeed, as Professor Kuznets has written, 'The ease with which national income comparisons, among countries with differing industrial and social structures, are currently made may largely be due to the shallowness of our knowledge and of our willingness to stay on the surface of social phenomena.'

7

INCOME AND PRODUCT IN UNDER-DEVELOPED COUNTRIES

Comments on The Paper by Professor Frankel[1]

by Frederic Benham

THIS paper raises two general questions. What is the value of national income estimates, especially for undeveloped countries? And how can economic progress best be promoted, especially in undeveloped countries?

The second question may be thought outside our scope. But Professor Frankel will not let us ignore it. 'The mere calculation of certain statistical aggregates,' he says, and we can almost hear his sibilant scorn as he says it, 'is clearly worthless unless they are intended as guides to social action or to our understanding of social and economic situations.'

I propose therefore to consider national income estimates, especially for undeveloped countries, first as a measure of welfare and then as a guide to public policy.

I. NATIONAL INCOME ESTIMATES AS A MEASURE OF WELFARE

We used to say, or at any rate economists such as Irving Fisher and Pigou used to say, that people desired goods and services not for their own sakes but for the sake of the satisfaction which they yielded. Irving Fisher brought in satisfaction mainly because he wanted to distinguish between Capital – the stock of all goods of all kinds existing at a given moment – and Income – the flow of satisfaction arising from the consumption of goods and services over time. But this distinction can be made just as well without introducing a 'psychic income' of satisfactions. A house built in 1951 is part of the Investment of 1951 – and if you don't want to count it as income, and Fisher didn't, then you needn't: the house, at its current value, is part of the Capital of the country as long as it lasts; and the services rendered by the house, the services of providing accommodation and shelter, are part of the National Income for every year that the house continues to be used.

The main reason why Pigou and others introduced satis-

[1] See No. 6, above. It should be noted that No. 6 is not the complete paper: part is now published in the *Oxford Economic Papers*, 1952. Dr. Benham replies to the complete paper.

faction was, I think, to provide an allegedly 'scientific' support for their view that the inequality of income should be reduced. The same aggregate of goods and services, they thought, would yield more total satisfaction if it were more equally distributed. But this cannot be proved. As Marshall pointed out, satisfaction cannot be measured. Those who would like inequality to be reduced can bring forward plenty of arguments in support of their view without resorting to the so-called 'Law' of Diminishing Marginal Utility of Income, which is an unprovable assertion about an immeasurable object.

When it became realized that there is 'no bridge' by which the satisfaction of one person can be compared with the satisfaction of another, a number of economists fell back on indifference curves. They said that at any rate we can say that one collection of goods gives more satisfaction than another collection to the same person at the same time. He buys one collection, or he would buy it if he could, rather than another, therefore the former gives him more satisfaction than the latter. But this last phrase is an unjustified addition. All we are really saying, and all we really know, is that he buys one collection rather than another. If we assert indignantly that of course this must mean that he prefers the former and therefore that it gives him more satisfaction, this last phrase is pleonastic – it is simply saying the same thing over again in different words. We can therefore agree with the conclusion of Professor Frankel: 'Meaningful measurement ceases at the point at which persons acquire objective goods and services; to get beyond is to enter the realm of hope and fancy.'

Having got rid of satisfaction, can we treat as 'meaningful' statistics of the quantities of goods and services produced and consumed, and of the amounts added to physical assets?

Here again Professor Frankel is discouraging. 'How can one attempt,' he asks, 'to assess whether the pre-industrial community is "better off" when, as in South Africa for example, it has undergone a rapid process of urbanization and has been integrated into a modern economy in a quite different social framework?' 'The very question,' he says, 'is itself illegitimate.'

I agree that we cannot say whether or not, taking everything into account, the community has gained by the change. Nor is it our job, as economists and statisticians, to pass any such judgement. But what we can say, and what many people will

find of interest, is what the average family consumes now as compared with what it consumed before. That is a question of ascertainable fact, not a question of making a value-judgement.

Exactly the same point applies, of course, to a comparison between an undeveloped and a developed country, for example between India and the United States. Opinions may differ on whether the Indian way of life or the American way of life is the better, but what the average family consumes in each country is a question of objective fact.

It is relevant, I think, to point out here that most leaders in undeveloped countries, certainly all those I have met, assert most strongly that their peoples do desire higher standards of living. They would be most resentful if improvements in standards of living were held back because some Western pundits thought this would be bad for them.

There is, of course, the technical difficulty of comparing standards of living when consumption-habits differ widely. But surely it would be foolish to throw up our hands in despair and to say that no comparison is possible. We know perfectly well that average standards of living are much higher in the United States than in India. Surely, therefore, we should try to get some measure, as free from imperfections as possible, of how great the difference is?

The sternest critic will admit, I hope, that at least the statisticians could list the quantities of the various items consumed per family and let the reader make the comparison for himself. If the reader wished, he could resolve the food items into a common denominator of calories or follow any similar devices which seemed to him appropriate for his particular purpose.

As estimators of national incomes, we do more. We value the goods and services consumed at their current prices. And we give other information also. We show to what extent a change in consumption over time was due to a change in output; or to a change in the terms of trade; or to a change in loans and gifts received from or paid to other countries; or to a change in the amount of investment, which of course may affect standards of living in the future.

Valuing the goods and services at current prices, however, merely shifts the comparability problem to the question of price-levels. At what rate are rupees and dollars, for example, to be converted into one another for this purpose?

I think that the most general practice is to deduct indirect taxes from market prices, thus removing one cause of differences in price-levels, and then to convert at the current rate of exchange between the two currencies. Admittedly, this often gives a somewhat misleading result. But why try to get everything into a single figure, that of national income per head of population?

Surely a partial solution, which should to some extent appease the critics, would be to follow the general practice but to supplement the national income statistics by other information relevant to comparisons of welfare. I may perhaps be allowed to illustrate from my conclusions on the national income of Malaya, which in 1949 was around £60 a head. I say: 'The national income per head in Malaya is much higher than in most neighbouring countries. For example, for India in 1949 Gross National Product (at factor cost) was estimated at only £23 a head. But the cost of living was higher (because wages and other money incomes were higher in relation to productivity) in Malaya than in India. Malaya took fuller advantage of both external and internal trade, and in consequence the costs of transporting and distributing exports and imports, and of trade between country and town, swelled the national income of Malaya more than that of India. There is no doubt that standards of living were substantially higher in Malaya than in most neighbouring countries, but the difference was less than was indicated by a mere arithmetical comparison of national income per head.'

Again, when comparing Malaya with the United Kingdom, I point out that 'the people of the United Kingdom need to spend more on substantial houses, warm clothing, and fuel than the people of a land of eternal summer. Moreover they are spending some 10 per cent of their National Income on Defence. Hence although standards of living for the bulk of the people (notably the manual workers) are higher in the United Kingdom, the difference is less than the national income figures indicate.'

Other differences to which attention might be drawn, where they are important, are differences in working conditions, especially hours of work, and in the proportion of women working for pay.

Before leaving this part of my remarks, I would like to touch

on another point. Some writers assert that for primitive economies based on self-sufficient 'households' or direct barter of goods and services national income estimates are completely inapplicable. They declare that if estimates are contrived for such inarticulated economies, they are devoid of economic meaning.

This is banging the door in our faces. But I think we can push in. If we list the goods and services consumed and can find another economy, with markets, where consumption patterns are very similar, why not price the goods and services of the former at the prices ruling in the latter? In fact, the usual situation is that the country has some exports and imports, and some local markets, as well as goods and services produced by families for their own consumption. Surely we must include such goods and services; to leave them out would give quite a false picture. And if we include them we should value them, in my view, at local market prices. For that is what the neighbours of the producers have to pay to get them. Even if there is no local market for a particular good or service, I do not think we should leave it out. It probably has an opportunity-cost; instead of growing, say, maize for their own consumption, the peasants might have used their land and their efforts to grow something else, for sale.

II. NATIONAL INCOME ESTIMATES AS A GUIDE TO PUBLIC POLICY

I turn to the second of the two general questions raised by this paper. How far are national income estimates useful as a guide to public policy?

The first point I want to make is that different people have different views on what public policy ought to be. They may agree on some general aim, for example, 'a continuous and permanent improvement in the well-being of the people', but only because it is expressed in such general terms as to be virtually meaningless. When it comes to definite and detailed proposals, men of good will often find themselves in opposite camps; that, of course, is one reason why there are political parties.

For example, some want to spend more on defence than others. Again, while possibly most of us would accept the conclusion that the economic problem of transforming backward areas is one of effecting a lasting and continuous rise in the ratio

of reproducible capital to population, some people in those areas strongly oppose the most important steps towards that end. In some countries no permanent economic progress is possible, in my view, without a reduction in numbers through birth control; all other measures can be only palliatives. Yet many of those who would benefit object to birth control on religious, nationalistic, or other grounds. In the short run, the best way of putting the above conclusion into practice is often external loans. Yet some people in undeveloped countries are very suspicious of accepting external loans. They fear that external loans would lead to too much foreign control of their economies; they prefer their independence to a rise in their standards of living.

Even when certain aims are generally accepted, they often conflict with one another to some extent, and people differ in the relative weight which they attach to each, and therefore disagree on specific proposals. For example, increased output, full employment, less inequality, and social security are all regarded as desirable by many people. But to some extent these four aims conflict with one another. Some undeveloped countries have refused, at different times, to take advantage of technical progress (usually in the form of increased mechanization) because although it would have increased output it might have caused some unemployment. Some people think that the British income-tax, which undoubtedly reduces inequality, has also reduced incentives to work and invest and should be modified. Again, a policy of providing full employment and social security may keep down output by reducing incentives and mobility.

Professor Frankel appears to suggest that disagreements on public policy might be avoided, or resolved, by an expert enquiry into the content of 'welfare'. 'One of the main tasks,' he says, 'which now confront economists, statisticians, and sociologists emerges more clearly, namely, to determine what factors constitute the welfare pattern.' I doubt very much whether economists, statisticians and sociologists would agree among themselves, let alone persuade others to agree, if they went into detailed and specific proposals. Some place more weight on a general improvement in standards of living, others on less inequality, others on full employment, others on social security and stability, others again on maintaining a certain way of life. Professor Frankel himself has pointed to the question-mark in the case of a primitive tribe which may rapidly become indus-

trialized. I do not think that the most expert opinions would do away with the differences of view between those who would say 'leave them as they are' and those who would say 'we have no right to refuse them higher standards of living'.

As an example of the type of specific proposal on which we might disagree among ourselves, we can take protection for local industries. It is sometimes urged that a national income estimate should show imports and exports in detail so that we can draw conclusions as to what import items can be produced locally, what real investments should be made in the various sectors of the economy for replacing imports and for increasing the standard of living, and so forth. I am fairly certain that on some specific proposals to establish certain local industries which cannot, at any rate for the present, stand on their own feet some of us would be in favour and some of us against.

If you agree with me that there are and always will be differences of opinion on public policy, it seems to follow that a national income estimate should not be designed to assist in carrying out some particular policy. It should be neutral. It would set out the relevant facts, showing the method of arriving at each figure and the degree of accuracy which it possesses, in such a way that the figures can be re-arranged if that is appropriate for any particular purpose, and in such a way that people of different views can all use them to base their arguments on knowledge rather than on 'hunches' or on fragmentary and incomplete statistics. It should give a comprehensive view of the economy as a whole and of the relation of different parts of it to one another.

Having said this, however, I come to my second point, which is that there are many things which a national income estimate cannot do and should not be expected to do. A thorough and informed discussion of any particular proposal usually requires a knowledge of facts far more detailed than those which can or should be included in a national income estimate. If you study the development plans of any country, for example those included in the Colombo Plan or the Monnet Plan for France, you will find detailed discussions of proposed engineering and other projects, with little or no reference to national income figures. In Jamaica, for example, the Economic Policy Committee made a very detailed investigation into the areas which might be suitable for irrigation. They considered soil types,

what crops could be grown, and what methods of irrigation were technically possible in each area. Then they considered whether the consequent increase in yield, expressed as an average annual sum of money, would exceed the costs of installing and maintaining the irrigation system and supplying the water, plus the additional costs of working the land in order to obtain the increased output, all these costs being expressed as an average annual sum of money. The Committee made similar detailed inquiries into a number of other projects. Not once did they need to refer to the estimate of national income. That came in only at the end, when they considered how much could be raised in increased taxation, and from whom, in order to pay for their proposals.

As, in my view, there should always be detailed and technical inquiries into specific proposals, I feel that we should not try to cram too much into national income estimates. For example, I do not agree that we should try to show who gains and who loses by discriminatory charges imposed by public utilities and other enterprises. It is by no means easy to say exactly how much discrimination there is. Some lower charges may be justified by greater ease of handling (rail transport, for example) or by off-peak consumption (for example, electricity). Nor is it easy to say who finally gets the benefit or bears the cost. In my view, a question such as this is best left out of national income estimates and made the subject of a special inquiry.

I am not saying that national income estimates are useless. Perhaps I may give one or two examples of how they may help in framing public policy.

The national income estimates for India have brought out the fact that output per head of population, and standards of living, have been falling – despite technical progress and new investment – over the last ten years. They may well have played an important part in leading Pandit Nehru to his conclusion that Family Planning is essential in India.

In most undeveloped countries, the paramount economic need is to increase output by increasing real capital per head, improving methods of production, getting more trained men, and so forth. As their national incomes expand, more can be spent on social services. But in some countries, the Windward Islands for example, the local demand for expanded social services has been so strong that external assistance has been diverted largely

to social services. These involve large annually recurrent expenditures, on teachers, nurses, and so forth, which their national incomes are not large enough to bear. This fact, and the need therefore to modify their policy, is brought out by estimates of their national income.

Some of you may think that although national income estimates are not adequate for micro-economic decisions – which particular investments projects are most likely to be fruitful, for example – they can nevertheless be used for macro-economic decisions. They can show the margin available for increased taxation, how much local saving is available, and so on. In Great Britain they are used partly to show the extent of the inflationary gap. But even in these fields I would not claim too much for them. For my third point, an obvious but important one, is that national income estimates relate to the past. Even if the Government is quite clear as to what policy it wants to follow, forecasting is necessary. It is not easy to forecast what wage-levels will be or what the prices of imports and exports will be. Indeed, it is quite possible to be seriously wrong, as post-war experience in Great Britain has shown. Some underdeveloped countries rely heavily on exports of one or two main products. Their future national income will depend to a considerable extent on the prices of those products, which may change very considerably in a short time. The most complete and accurate estimate of last year's national income is not much use as a guide if this year's national income turns out to be very different from last year's.

My conclusion, then, is that although national income estimates are useful, as Dr. Kuznets has said, in giving a comprehensive view of the economy as a whole, they should be supplemented by other information when making economic comparisons between countries or for the same country over a period of time and by detailed technical investigations for particular developmental projects. We should not try to cram too much into them or claim too much for them. As they say on the New York Stock Exchange: 'Bulls get something; bears get something; hogs get nothing.'

8

SOME REFLECTIONS ON THE COMPARABILITY OF REAL NATIONAL INCOMES OF INDUSTRIALIZED AND UNDER-DEVELOPED COUNTRIES

by V. K. R. V. Rao

I. INTRODUCTION

REAL income is difficult to define; it is even more difficult to measure. This is true of individuals, in spite of their living in the same country, and having more or less similar conceptions regarding the standard of living. The amount of satisfaction that even the same person derives from the same money income at different periods of time not only defies statistical detection, but also lacks an adequate base in logic. When it comes to a question of comparing the real income of different individuals, many difficulties, both conceptual and statistical, arise; and the problem becomes almost insoluble when one aggregates the real incomes of individuals into national real incomes and then seeks to compare them. As pointed out by Loreto Dominguez, 'Comparing levels of national income in real terms in two periods as between countries is one of the most difficult tasks an economist or statistician encounters, for it is impossible to avoid the welfare concepts which explicitly or implicitly always enter into the analysis.'[1] As Professor Kuznets has pointed out, 'The goal of economic activity is to satisfy wants of individual consumers who are members of the nation present and future. This is the only goal that seems to underlie the performance of a variety of economies and the only one that can be associated with the economic aspect of social welfare.'[2] The discussion has to be of national income as a measure of net product, an approximation to social welfare; and such a discussion runs into the most awful difficulties, both conceptual and statistical, especially when one seeks to compare national incomes as measures in terms of 'better off' or 'worse off' of different economies. Nevertheless, such comparisons are daily being made. The

[1] Loreto M. Dominguez, National Income Estimates of Latin-American Countries, *Studies in Income and Wealth*, National Bureau of Economic Research, Vol. X, 1947, p. 234.

[2] Simon Kuznets, Government Product and National Income, *Income and Wealth Series I*, International Association for Research in Income and Wealth, Bowes & Bowes, Cambridge, 1951, p. 180.

statistical office of the United Nations Organization has brought out two annual reports giving comparative figures of the national incomes of 32 different countries; and more recently the same organization has brought out a document on the volume and distribution of national income in under-developed countries. The latter document, while cautioning its readers about the dangers of comparing the national incomes of developed and under-developed countries on account of the differences in their organization of production, social structures, etc., nevertheless does make such a comparison. It states:

> Thus, Asia, with over half the world's population, has only one-tenth of the world's national income. North America, on the other hand, with less than 10% of the world's population, accounts for nearly 45% of the world's national income. Asia, Africa and South America together, with over 65% of the world's population, receive somewhat in excess of 15% of the world's national income while the remaining areas, with only 35% of the world's population receive about 85% of the world's income.[1]

And these remarks have been carried over the world's press and received a great deal of publicity in the under-developed countries.

I think, therefore, that it is worth while to consider afresh this question of comparability of national incomes. Obviously, while the comparison is instituted in monetary terms, the objective behind it is a comparison of national incomes in real terms, in terms of what Professor Kuznets calls 'better off' or 'worse off'. The problem presents special difficulties if the national incomes sought to be compared refer to such diverse economies as those of what are called developed and under-developed countries, countries for example like the United States and India. I propose to discuss below some of the factors, both conceptual and statistical, that have to be taken into account when instituting such a comparison.

II. NON-MONETARY INCOME

To begin with, not all activity which leads to the emergence of satisfaction is classed as economic activity. Beyond a certain point the distinction between producing activity and consuming activity fades into the air, and convention and social structure

[1] *Volume and Distribution of National Income in Under-developed Countries*, United Nations Economic and Social Council, p. 7, para. 16 (mimeographed).

rather than logic decides the category under which they should be classified. Not all even of what is called economic activity leads to marketed output, either of the goods or services that are the result of such activity, and the degree of development that determines the classification. Nor is it clear even of the marketed output that it represents net concepts in all cases or that it is indicative of corresponding differences in satisfactions, which after all is the concept most germane to welfare. And finally, there is the problem of differences in valuations, and the almost intractable question of convertibility into real terms of different monetary units.

This brief summary is, I believe, sufficient to indicate the complexity of the question of comparability of real national incomes. For the purposes of this paper, I shall concern myself with only a few broad matters of principle, leaving questions of detail for perhaps a later occasion.

The first question when considering comparability is the consideration of what is excluded from the computation of the national incomes which are compared. Professor Kuznets[1] is perfectly right when he remarks that 'limiting national income to results of economic and productive pursuits forced us to exclude many satisfaction-yielding activities, primarily those conducted within the family, that may be considered part of life in general rather than economic activity proper'. I would also agree with his observation that 'exclusion of the products of the family economy, characteristic of virtually all national income estimates seriously limits their validity as measures of all scarce and disposable goods produced by the nation'.[2] Mr. Solomon Fabricant[3] rightly points out that, as the output of family economy is largely omitted, even complete identity of coverage of various categories of production, as well as identical treatment of each, will not ensure full comparability among the national income figures of different countries. 'The relative importance of the omitted categories will vary from country to country, and accordingly the effective percentage of coverage of total production by the national income figures'. Obviously

[1] Simon Kuznets, *National Income and its Composition, 1919–1938*, Vol. I, National Bureau of Economic Research, New York, 1941, p. 55.

[2] *Ibid.*, p. 10.

[3] Comment by Solomon Fabricant on the paper National Income Originating in Financial Intermediaries, by Dwight B. Yntema, *Studies in Income and Wealth*, Vol. X, *op. cit.*, p. 60.

then, when comparing real national incomes, one has to inquire into the extent to which the products of what is called family economy are excluded and its comparative significance on the degree to which national income figures fail to be a true index of productive activity.

I am surprised, however, at the persistence with which the belief is held that the national incomes of under-developed economies exclude more of the activities that are pertinent to economic welfare than those of the more developed economies. Thus, e.g., the first U.N. Report on *National Income Statistics*[1] specifies the following five types of non-monetary items, viz.:

(1) Unpaid services of housewives;

(2) Net rental value of owner-occupied houses;

(3) Services of durable consumer goods;

(4) Farmers' consumption of own produce and similar items;

(5) payments in kind;

and proceeds to state that the fact that not all non-monetary items are included may, where inter-country comparisons are made, obscure the true picture to some extent, adding: 'This is particularly the case in comparison between industrialized and under-developed countries, since in the latter subsistence income forms a considerable part of total output.'[2] The U.N. Report on 'Volume and Distribution of National Income in Under-developed Countries'[3] states that 'The conceptual differences are particularly serious in the case of comparisons between under-developed and industrialized countries because more or less of the national output in the various under-developed countries is produced and consumed without passing through commercial channels. This raises a problem of including the whole of such product in the national income estimate and of evaluating it in terms of money.' There seems to be some kind of an implicit assumption that the products of the family economy are altogether excluded from the computation of the national incomes of under-developed countries. In the alternative, the implicit assumption seems to be that certain non-marketed services excluded from the national incomes of indus-

[1] *National Income Statistics, 1938–1948*, Statistical Office of the United Nations, 1950, p. 8.

[2] *Ibid.*, p. 9.

[3] 'Volume and Distribution of National Income in Under-developed Countries', United Nations Economic and Social Council, p. 4, para. 6.

trialized countries are somewhat unimportant as compared to the similar items for under-developed countries, and that the latter are, in comparative terms, more significant.

The first assumption is not correct. If we take the recent estimate put forward by the Indian National Income Committee of the national income of India for 1948–49[1] the following items are all included:

(1) Net rental value of owner-occupied houses;

(2) Farmers' consumption of own produce;

(3) Activities ancillary to agriculture, including processing, marketing and transport services performed by the cultivator;

(4) Payments in kind of urban and rural labour, and also of army and other government servants.

The fact that the family economy or the household enterprise contributes a large share of national output in India as compared to a highly industrialized country like the United States is undoubtedly true; it is also true that this does raise difficulties in regard to the problem of imputation, and valuation of these non-marketed services, and there is reason for honest differences of opinion regarding the statistical methods followed; but this does not mean that these non-marketed goods and services are not included in the national income of India. Subsistence income therefore does find inclusion in the national incomes of under-developed countries, and this includes all the services which find inclusion in the national incomes of industrialized countries.

Let me now turn to the second point, viz. that certain non-marketed services excluded from both national incomes lead to an under-estimation of the real income of the under-developed countries. The most hardy example adduced for this purpose is the services of housewives.

There is no doubt that the services of housewives do contribute to economic welfare and therefore to the real national income. But are they negligible in an industrialized country and significant in an under-developed country?

Let me take, e.g., the United States. In his monumental work on *National Income and its Composition*, 1919–1938[2] of the

[1] First Report of the National Income Committee, April 1951, Ministry of Finance, Government of India.

[2] Simon Kuznets, *National Income and its Composition, 1919–1938, op. cit.*, Vol. II, p. 434.

United States, Professor Kuznets points out that the rough dollar equivalent of housewives' services amounted to some 23 billion dollars or somewhat more than one-fourth of the total national income in 1929. It is not likely that the proportions will be any different in the case of India, especially when it is recalled that the proportion of gainfully occupied population in India and the United States for comparable years (1948–49) is practically the same, being 39 per cent in the case of India as against 40 per cent in the case of the United States. Nor is it correct to assume that the population not gainfully occupied in the United States is merely indulging in consuming activity while that in India is significantly engaged in producing activity in the field of non-marketed services. True, the non-marketed services of an economic kind that housewives or householders produce in India are not identical with those that are produced in the United States, but there can be no denying the fact that such services do constitute a good part of the activity of households in the latter country. Thus, e.g., a great deal of washing, cleaning, sweeping, cooking, laundering and similar activities are performed by housewives in the United States; in truth, such activities are much more prevalent in that country in the case of certain income groups than they are in the under-developed countries with their semi-feudal social structures and the use of paid domestic servants by their higher income groups. Moreover, the very extent and nature of industrial development makes it possible, in some cases actually necessary, for non-marketed services to be produced by households, even though such services also form the subject of commercial operations. A few examples I may mention of services of this kind are motor driving, house repairing, knitting, home tailoring, clothes repairing, house painting, furniture repairing, etc. I have long been stressing this point that the non-marketed services of households which are not included in computations of national income are significant for both industrial and under-developed countries, and that therefore their exclusion does not lead to any special under-estimation of the real income of under-developed countries as compared with those of the industrialized countries. I am therefore very happy to find recognition of this point in the second U.N. Report of National Incomes.[1] I can do no better

[1] *National Income Statistics, 1938–1948, op. cit.*, p. 16.

to support my point than to quote the following extract from that document:

> As an argument for inclusion of the unpaid services of housewives and other members of the family, it is stated that a more complete picture is thus obtained of the total output of goods and services in a nation's economy. It is not always easy to foresee how inclusion would affect intercountry comparisons. *In highly developed countries characterized by shortage of paid domestic help, the unpaid services of housewives may be very substantial and to these should be added such services as driving one's own automobile or repairing one's house, items which are likewise not included in the conventional definition of national income.* (Italics mine.)

I trust that after this the bogey of non-inclusion of unpaid services of housewives in the under-developed countries will be laid at rest in discussions on inter-country comparisons of real national income.

There is, however, one important item of non-marketed service which is excluded from both national incomes, but which exclusion does definitely make for under-estimation of real income much more in the one case than in the other. I refer to services of durable consumption goods or item 3 on the U.N. list of non-monetary items.

There is no doubt about the fact that durable consumption goods yield continuing flows of satisfaction and therefore make a legitimate difference to economic welfare and real national incomes. In the industrialized countries, production of durable consumption goods forms a significant proportion of the national output, and the stock of such goods in the hands of consumers is constantly growing. Thus, as pointed out by Dr. Margaret Reid,[1] even if the list of durable consumption goods be confined only to major furnishings and equipment and automobiles, 'the rate of growth of consumer durables rose from 9.6% of the value of finished commodities in 1879 to 18.1% in 1937'. There is no doubt that one of the significant factors constituting the difference in the real national income of an industrialized country and an under-developed country is the substantial income which the former derives from the services of its stock of durable consumption goods; and I am convinced that the imputed value involved would be positive and signifi-

[1] Margaret G. Reid, Distribution of Non-money Income, *Studies in Income and Wealth*, Vol. XIII, 1951, p. 128.

cant, even if account is taken of repairs and depreciation charges contingent on their treatment as capital equipment. It is indeed very surprising that while national income estimators in the field of inter-country comparisons have been quick to notice the alleged effect of the non-inclusion of housewives' services on comparability of real national incomes, they have not given attention to the significance of the non-inclusion of the services of durable consumption goods in this regard. I believe that this non-inclusion leads to a real element of under-estimation even in the case of industrialized countries in comparison with the more highly industrialized among their number; it is very much more so, when comparisons are instituted of the real national incomes of industrialized and under-developed countries. I would therefore respectfully request Dr. Derksen to take note of this point in his next edition of the U.N. Report on National Incomes.

Somewhat similar is the effect on comparability of the non-inclusion of the net rental value of public buildings. Here again is a significant factor that constitutes the difference in the real national incomes of different countries; public buildings undoubtedly yield continuous flows of economic satisfactions and therefore contribute to economic welfare and real national income. The imputed value of their services is not covered by the cost of their maintenance; and there is no doubt that a balance from the income attributable to them escapes inclusion in current computations of national income. It is true that this item is excluded from the national incomes of both industrialized and under-developed countries; but the exclusion is far less significant in the case of the latter than in that of the former in terms of the effect on real income. It is therefore necessary to note this as a qualifying factor on inter-country comparisons of real national incomes, especially when the comparison is between industrialized and under-developed countries.

It is sometimes contended that services included in the national incomes of industrialized countries do not find inclusion in those of under-developed countries, as they are carried on outside the monetary sphere. Thus, it has been stated, 'Various cultural, recreational, and other activities performed commercially in the industrialized countries are carried on in the under-developed countries, particularly in the rural areas, outside the monetary sphere, and do not give rise to monetary

incomes.'[1] In fact, such activities are carried on outside the monetary sphere, perhaps to an even larger extent, in the educated, organized and urbanized communities of the industrialized countries, while even in the under-developed countries such activities are performed commercially. In fact, one of the most significant factors constituting the difference in the real national incomes of industrialized and under-developed countries is the much larger quantum of cultural, recreational and similar services in the former, due no doubt partly to their being the subject of commercial and specialized operations, but also due partly to the much more effective and efficient way in which they are the subject of activity outside the monetary sphere. I am not therefore convinced that the exclusion of non-marketed activities of this kind results in an under-estimation of the real national incomes of under-developed countries nor that the inclusion of marketed or commercial activities of this kind leads to an over-estimation of the real national income of the industrialized countries.

To sum up this part of the discussion, viz. on the significance of non-marketed output of goods and services in computations of national incomes of industrialized and under-developed countries:

Every economy, whether it is industrialized or under-developed, contains non-monetary items, some of which find an imputed valuation in computations of national income, and some of which do not find such inclusion. The items which find inclusion in the case of the industrialized countries also find inclusion in the case of the under-developed countries, though they are subject, in the latter case, to the statistical and even conceptual difficulties inherent in imputation. The items which are not included are the same in the case of both types of countries. These are (1) service output – mainly intended for direct consumption or final services – of households, (2) services of durable consumption goods, and (3) services of public buildings or durable consumption goods owned by the community. The exclusion of the first does not lead to any significant under-estimation of the real national income of the under-developed countries as compared to that of the industrialized countries; it may possibly lead to the opposite result, especially if the

[1] Volume and Distribution of National Income in Under-developed Countries, United Nations Economic and Social Council, para. 19, p. 8.

comparison is between a highly industrialized country like the United States and a relatively under-developed country like India. The exclusion of items (2) and (3) lead to a definite underestimation of the real income of the industrialized countries as compared to that of the under-developed countries, though it may be difficult to give this difference a statistical magnitude. This difference is greater, the greater the degree of industrialization in the industrialized country as compared to the underdeveloped economy.

III. NET VERSUS GROSS INCOME

Having discussed the significance of non-monetary items in national income computation on the comparability of real national incomes, the next question is about the items which are included. How far does the bundle of goods and services that are included in the case of both industrialized and underdeveloped countries represent net rather than gross quantities? Is the problem of netting the same for both these types of economies or are special deductions necessary in one case or the other in order to bring about comparability of real national incomes?

Before dealing with these questions, which are quite complex and do not lend themselves to any categorical or unambiguous answer, it would be useful to mention and dismiss certain other items concerned with netting. Thus, the deduction which is made for depreciation is not uniform for all countries, either in the items for which depreciation allowances are made or in the rates at which the allowances are made or the basis on which the allowances are calculated. This is true even of the industrialized countries themselves; it is more so in the case of the industrialized countries in comparison with the under-developed countries, especially in regard to the admissibility or otherwise of allowing depreciation on land. I doubt, however, if significant differences in respect of comparability of real national incomes arise from this factor, though it would be useful if comparative studies were made on the subject.

Then there is the question of allowances for depletion of natural resources, especially mines. The statisticians have decided that it is not necessary to make a deduction on this account; and therefore no deductions are made for depletion

from the national incomes either of industrialized or under-developed countries. This, however, does not mean that its effect on the netness of the national income is the same in the case of all countries; it all depends upon the importance of mining activity in the national output of goods and services. If we take the United States and India, for example, the proportion to total occupied population of the population occupied in mining is 1.7 and 0.4 per cent respectively for the two countries in 1948, while the proportion of the mining industry's contribution to their respective national incomes for that year was 2.2 and 0.7 per cent respectively. Obviously, in this case, the non-allowance of depletion makes for a relative over-estimation of the income of the United States as compared to that of India. There would, however, be other cases of industrialized and under-developed countries, where mining would be proportionately more important in the latter, and therefore the over-estimation of real income would be greater in their cases. In comparing real national incomes, therefore, it is useful to make a note of the extent to which mining forms a part of the national incomes and therefore includes an element of grossness in the computations.

There is one more item which finds inclusion in the national income calculations of some countries, but which does not find a place in those of others. This is the vexed item of changes in the volume and value of inventories. Largely for want of data rather than on any difference in principle, this item does not find inclusion in the national income computations of under-developed countries. The recent estimate of the national income of India, for example, does not make an allowance for this item either plus or minus; while the national income of the United States definitely includes it. It is very difficult to determine on an *a priori* basis whether this results in over-estimation or under-estimation of the real income of India as compared to that of the United States, but there is no doubt that it does qualify the comparison; and this difficulty is bound to remain for a long time in the case of the under-developed countries as by the very nature of their economies, statistics either of quantity or of value of inventories will continue to be difficult to obtain.

Now I return to the question of whether any special deductions are necessary in one case or the other from the bundle of goods and services representing the national incomes of indus-

trialized and under-developed countries in order that they both represent *net* quantities. It is a well-known fact that services claim a much greater share of national product in the case of industrialized countries as compared with under-developed countries; and this is usually due largely to the greater rôle of activities concerned with distribution and government. The following table clearly reveals the position as regards India and the United States for the year 1948:

Thus items 4 to 7, or what may broadly be termed the service sector, accounts for 50 per cent of the occupied population and 50.4 per cent of the national income in the case of the United States, while the corresponding figures for India are only 17.8 and 31.8 per cent respectively. The question arises whether all this income that originates from the service sectors, particularly those that fall under items 4 and 6, viz. commerce, transport, communications, and government represent corresponding real additions to the national income, especially in the context of inter-country comparisons of real national income. From one point of view it is undoubtedly true that the greater rôle of services is characteristic of a developed economy, and that the inclusion of the service sectors in both national incomes is necessary for determining differences in their real national incomes. But does not the greater magnitude of the service element under items 4 and 6 in the U.S.A. include at least a portion which represents a cost rather than an income factor and therefore calls for a deduction in order to validate its use in comparisons of real national income? Professor Kuznets has answered this question in the affirmative and made several suggestions for taking this into account in order to ensure validity of inter-country comparisons. I quote:

> Three suggestions seem to be in order. First, such activities as beyond any doubt represent payments by consumers for services that are nothing but occupational facilities should be excluded from the estimates for both types of country. Clear examples are commutation to and from work, and payments to unions and employment agencies; but one might add almost the entire gamut of what the Department of Commerce classifies as business services in its estimate of consumers' outlay (bank fees, brokerage fees, etc.). Second, where in industrial societies the costs of consumer services are inflated by the difficulties of urban life, some revaluation of these services by comparison with their costs in

TABLE I[1]
(Figures in millions)

Items	Distribution of Occupied Population				National Income by Source			
	India	%	U.S.A.	%	India (Rs.)	%	U.S.A. ($)	%
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. Agriculture	90.5	68.2	7.4	12.5	41,500.0	50.1	22,468.0	10.0
2. Mining	0.6	0.4	1.0	1.7	600.0	0.7	4,903.0	2.2
3. Manufacture	18.1	13.6	21.1	35.8	14,400.0	17.4	84,510.0	37.4
4. Commerce, transport, communications	10.7	8.1	17.6	29.9	17,000.0	20.5	79,941.0	35.4
5. Professions and liberal arts	5.0	3.8	2.7	4.5	3,200.0	3.9	9,928.0	4.4
6. Government services	3.6	2.7	6.2	10.5	4,600.0	5.6	17,823.0	7.9
7. Domestic services	4.2	3.2	3.0	5.1	1,500.0	1.8	6,167.0	2.7
8. Total	132.7	100.0	58.9	100.0	82,800.0	100.0	225,740.0	100.0

[1] *Note:* Figures in col. (2) and col. (6) relating to India for the different items are taken from Table 4, p. 31, of the *First Report of the National Income Committee*, April 1951. The total national income for India given in above table does not include income from house property.

Corresponding figures in col. (4) and col. (8) relating to United States are compiled from Table 28 and Table 13 in the July 1949 issue of the *Survey of Current Business.*

In order to make the figures available therein comparable to the figures for India the following classification is made:

AGRICULTURE AND MINING as given in Table (13) and Table (28) in *Survey of Current Business:* MANUFACTURE: Total of: Contract construction, manufacturing, Hotels and other lodging places, commercial and trade schools and employment agencies, miscellaneous repair services and hand trades, motion pictures, amusement and recreation, except motion pictures, Federal government enterprises and State and Local Government enterprises.

COMMERCE, TRANSPORT AND COMMUNICATIONS: Total of: Wholesale and retail trade, Finance, insurance and real estate, Transportation and communications and public utilities.

PROFESSIONS AND LIBERAL ARTS: Total of: Business services, Medical and other health services, Legal services, Engineering and other professional services, educational services, religious organization and non-profit membership organizations.

GOVERNMENT SERVICES: Total of: Federal-general Government, Civilian (except work relief), Military, work relief and State and Local-general Government, public education, Non-school (except work relief) and work relief.

DOMESTIC SERVICES: Total of personal services and private households.

The United States National Income excludes the quantity relating to '*Rest of the World*'.

rural communities is in order. The magnitudes involved, especially in such an item as cash and imputed rent on housing are quite large. Finally, it seems indispensable to include in national income only such governmental activities as can be classified as direct services to ultimate consumers. This most important and inescapable step is urged here in full cognizance of the statistical difficulties, which are great. But if national income figures are to retain any meaning as measures of the real flow of goods to ultimate consumers or to stock of capital the huge duplication piled up by considering all governmental activity as a final product must be removed. Such a step is important and necessary even for intra-country comparisons over time; it is equally if not more important for comparisons between industrial and pre-industrial societies.[1]

I must confess to a considerable measure of sympathy for the substance of Professor Kuznet's contention. The services he mentions, however, are so mixed in their content that it would be difficult to separate the elements of grossness that are present in them from the net income that they also contain. Thus, e.g., take the question of the services that are said to represent the costs of urban life. The urban transport system is not only used for taking the worker to his place of work and back to his residence but is also used for taking him on his other and presumably more pleasant errands, as well as providing the convenience of quick and comparatively cheap transport to the members of his family. Similarly payment for business services such as bank fees, brokerage fees, etc., by the consumer is no doubt an incident of an urban industrial civilization, but it also enables him to get services which he values and otherwise would not have obtained. In fact, it seems to me that Professor Kuznets does not do enough justice to the enormous consumer's surplus which the member of an urban and industrial civilization obtains from what Marshall calls 'his opportunities or from his conjuncture'.[2] There is no doubt that citizens of under-developed countries do not enjoy such a consumer's surplus and to that extent, therefore, their money income contains an element of over-estimation of their real income as compared to that of citizens of industrialized countries who possess this surplus. It is of course almost impossible to give statistical content to this

[1] Simon Kuznets, National Income and Industrial Structure, *Proceedings of the International Statistical Conferences*, 1947, Vol. V, p. 219.

[2] Alfred Marshall, *Principles of Economics*, 8th edition, Book III, Ch. VI, p. 125.

difference in real incomes, but that it exists cannot be denied. Even after taking this into account, however, I would incline to the view that the national incomes of highly industrialized countries contain an element of grossness in the valuation placed on certain services sectors as compared to those of under-developed countries, and to that extent tend to overstate their real national income.

But a good deal of research and special study is required before one can put forward any specific deductions that should be made on this account from the national incomes of industrialized countries in order to facilitate comparison of their real national incomes with those of under-developed countries. I feel sure that any such study, while revealing the presence of a certain measure of grossness in what Professor Kuznets calls occupational expenses of ultimate consumers, inflated costs of urban living, and intermediate products of government activities, would also reveal the presence of an element of real income in the services represented by these costs, which element would not be found in the absence of these items. I am, therefore, not prepared to agree that these elements should be totally excluded from national income estimates for both industrial and pre-ndustrial countries in order to make comparable their real national incomes. Nor can I agree to the procedure suggested by Kuznets of inflating the corresponding elements in the national incomes of pre-industrial countries to achieve a comparable level of grossness. In fact, the latter procedure would make completely unreal the national income estimates of under-developed countries, while its logical basis would be even less than that of the procedure I have already rejected, viz. that of excluding these elements from the estimates of national income of both these types of countries.

All the same, an element of grossness is there on this account in the national incomes of industrialized countries which is not equally present in those of under-developed countries, and to this extent the difference in the real national incomes of these two types of countries is less than what would normally be inferred from the difference in their national incomes. I would be inclined to state this conclusion not in terms of the under-developed countries being 'better off' than their national incomes would indicate, but in terms of the industrialized countries not being as 'well off' as their national incomes may

indicate. Maybe this is a distinction without a difference, but I feel certain that there is a real distinction in terms of economic welfare, and therefore of real income, between saying that A is not as badly off as compared to B in terms of their comparative levels of real income and saying that B is not as well off as compared to A in terms of their comparative levels of real income. Behind comparative levels there do lie concealed absolute magnitudes as well, and the latter formulation would do better justice to both absolute and comparative levels than the former would. Taking the United States and India, e.g., I would prefer to say that the real national income of the United States is not as much higher than that of India as is indicated by the comparative levels of their national income. This would take due note both of the poverty of India and of the element of over-estimation of real income contained in the national income of the United States, due to the presence therein of the gross elements discussed above.

IV. INCOME LEVEL AND ECONOMIC WELFARE

We have so far considered the question of comparability of real national incomes from the point of view of the totality of the goods and services that constitute their respective money national incomes. We have inquired into the question of what goods and services are excluded from the bundles of either or both industrialized and under-developed countries, and tried to assess the effect of the same on the comparability of their real national incomes. We then inquired into the netness of some of the goods and services which, though finding inclusion in the estimates of both types of countries, seem to be more peculiarly present and in much larger measure in the estimates of national income of the industrialized countries; and tried to assess the extent to which they concealed gross elements, and the effect of the same on the use of their national income estimates for comparing levels of real national income. We shall now proceed to inquire into the relation of the contents of these national bundles to economic welfare, for after all, it is the comparative levels of economic welfare which we seek to investigate when we institute a comparison of their real national incomes. It may well be the case that goods and services included in either of the bundles may be net items and may constitute economic goods from the

point of view of the individual country concerned, but may not equally indicate differences in real income when looked at from the point of view of the other country. It is, therefore, important to link up the commodity or service included in the national income of one country with the want which it seeks to satisfy and inquire whether (a) similar wants exist in the other country and (b), if they do, whether their satisfaction requires a similar quantum or quality of goods and services as in the first country. There is also the question whether the wants satisfied by what are undoubtedly economic goods and services do really promote human health and happiness in the countries concerned, and if not, whether their unequal presence in two countries whose real national incomes are being compared is not a factor indicating over-estimation or under-estimation as the case may be in their comparative levels of economic welfare.

To begin with, human wants are partly the result of geographical, climatic and other factors of the physical environment, and partly the result of history, culture, convention and other factors of the social environment. To this must be added what may be called commercially induced wants, which is a phenomenon peculiar, if not in its quality at least in its quantity, to an urban-cum-industrial civilization and therefore to the economies of industrialized countries. To complete the discussion, one must also add differences, if any, in human attitudes to the whole phenomenon of wants, a point to which Marshall draws attention in his discussion of value and utility; he says: 'In every civilized country there have been some followers of the Buddhistic doctrine that a placid serenity is the highest ideal of life; that it is the part of the wise man to root out of his nature as many wants and desires as he can; that real riches consist not in the abundance of goods but in the paucity of wants. At the other extreme are those who maintain that the growth of new wants and desires is always beneficial because it stimulates people to increased exertions. They seem to have made the mistake, as Herbert Spencer says, of supposing that life is for working, instead of working for life.'[1]

Marshall of course did not pursue the controversy, but contented himself with saying that the fullness of life lies in the development and activity of as many and as high faculties as possible. But there is a difference between activity which is

[1] Marshall, *op. cit.*, Book III, Ch. VI, p. 136.

motivated by material ends and that which finds its *raison d'être* in ends of other kinds. The attitude to what may be called material wants, including services, may differ not only between individuals in the same country, but may also constitute the subject of national differences. National attitudes, subject always to the limitation which attends its extension to any particular individual or set of individuals in the country concerned, may differ in the view they take of the desirability of wants in general and the utility of seeking to satisfy them. When this happens, there is a basic difference in the content of what is regarded as economic welfare, and it would be difficult to draw any worthwhile inferences regarding differences in real national incomes from differences in the size, variety and quality of the bundles of goods and services that constitute their national incomes.

Let us first take the wants that are linked with the physical environment. While wants in the abstract, such as the basic wants of food, clothing and shelter, are independent of differences in the physical environment, the quantum and quality of the goods and services that are needed to satisfy these wants are certainly not independent of such differences. Thus, the want for food in a cold climate requires for its satisfaction a greater measure of fats in the diet than it does in a tropical climate. It is also suggested that climatic differences necessitate larger intakes of food even in terms of absolute quantity of carbohydrates in the cold countries as compared to the warm countries. It would, therefore, be possible, given the appropriate differences in climate, for two countries to have identical levels of economic welfare in terms of their food consumption, even though the actual quantity and variety of the foods consumed in the one case may be absolutely and significantly larger than in the case of the other. The same is true of the want for clothing and shelter as well. From a comparative point of view, therefore, there seems to be an element of grossness in the goods and services which satisfy a given want in an absolute sense in one country as compared to the goods and services which satisfy the same want in another country.

The same is also true of different places in the same country if those places differ significantly from each other in their climate and other factors of physical environment. A study of workers' budgets in 34 cities in the United States made by the Department of Labour in 1948 showed that 'the principal factors in

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the inter-city differences are the cost of housing, which depends upon many local circumstances, and variations in fuel and clothing costs, which depend mainly on differences in climate, transportation, and taxes'.[1] The report makes special reference to clothing costs and states: 'Clothing is the major group, in addition to housing, that reflects differences in costs due to climate. Clothing costs are therefore lowest in the warmer cities and highest in the colder cities. The difference is shown between Jacksonville, where the clothing cost in June 1947 was $415 a year, and Minneapolis, where it was $477.'[2] Unfortunately, similar studies have not been carried out in intra-country differences in consumption costs which are the result of climatic and other factors of physical environment, but there can be no denying their existence. Taking the United States and India, I think that the national income of the former contains an element of over-estimation in real terms as compared to that of the latter due to this factor.

Difficulties in intra-country comparisons of real income also arise when the two countries in question have differed widely in culture, customs and convention, and the wants arising from the social environment are therefore quite different in the two countries. These differences are particularly important in the case of industrialized and under-developed countries. As Professor Morris Copeland has pointed out: 'The task of making such inter-country comparisons will be more difficult where the cultural differences are wider than they are between the United States and the United Kingdom.'[3] There is no doubt that this remark would apply with full force to any attempt at comparing the real national incomes of India and of the United States. To mention a rather gruesome illustration, a lot of wood is used in the disposal of the dead in both India and the United States, but in the former case it is used as fuel, while in the latter case it is used for making coffins; the undertakers in the United States draw a larger income than the scavengers and watchmen who work on the crematoriums in India. Similarly, there are vast differences in the style of dress including footwear and headgear, the style of food, including the consumption of fish and

[1] Workers' Budget in the United States – City Families and Single Persons, 1946 and 1947; *Bulletin No. 927*, U.S. Department of Labor, p. 23.
[2] *Ibid.*, pp. 25–26.
[3] Morris A. Copeland, Problems of International Comparisons of Income and Wealth, *Studies in Income and Wealth*, Vol. X, *op. cit.*, p. 159.

meat, the style of religious worship, the type of household utensils used, the type of toilet articles used, and so on. Moreover, there are commodities and services classed as economic goods and entering into the national income of India or the United States as the case may be, which simply do not figure in the other country. As Mr. L. Dominguez points out in his study of the national incomes of Latin American countries, 'Many items entering the national income of the United States are not used in some South American countries. *This means that conditions are simply different, not worse.*'[1] (Italics mine.) These remarks are equally applicable to any comparison of the real national incomes of India and the United States. On the whole, I would be inclined to hold that what may broadly be called conventional wants are much more numerous and expensive in the United States than in India, and the bundles of goods and services that serve to satisfy these wants constitute a much larger percentage of the national income of United States than they do of the national income of India. It is true that this difference does reflect in part at least a difference in their real national incomes, but it is also true that a part of the difference is merely indicative of difference in conditions and does not signify differences in satisfactions or real incomes. On the whole, I would suggest that the presence of conventional wants and others arising out of the social environment lead to an overestimation of the real income of the United States as compared to that of India; and broadly speaking this would also be true of the real incomes of industrialized countries as compared to those of under-developed countries.

Then there is the question of wants that require for their satisfaction what are undoubtedly economic goods, but the satisfactions resulting from which do not add to the health or well-being of persons, but in fact actually do them damage. I do not think that such wants are peculiar to the industrialized countries or that they do not exist in the under-developed countries. For example, the narcotic *bhang* in India or the country liquor known as *toddy* are regarded as harmful and unproductive of any real addition to well-being as the liquors and spirits in the United States. But the extent to which they figure in the national income of the United States is much

[1] Loreto M. Dominguez, National Income Estimates of Latin American Countries, *Studies in Income and Wealth*, Vol. X, *op. cit.*, p. 241.

greater than is the case with India. To this extent, they involve an over-estimation of the real income of the United States; and broadly speaking, I think the same would be the case with incomes of other industrialized countries.

Finally, there is the whole question of attitude to wants and its implications for determining the relation between economic welfare and any given national bundles of commodities and services. It is said, e.g., that in countries like India most people do not believe in the philosophy that ever-increasing wants with ever-increasing bundles of goods and services to satisfy these wants contribute to ever-increasing additions to economic welfare. The people of India, we are also told, believe in limitation of wants, and associate maximum economic welfare with plain living and high thinking. Therefore, it is argued that the larger bundles of goods and services needed for satisfying a larger number of wants that constitute the national income of the United States do not indicate a proportionately larger real income as compared to that indicated by the smaller bundles of goods and services constituting India's national income that are used for satisfying a smaller number of wants. Therefore, the national income of the United States presumably contains a large measure of over-estimation of real income as compared to that of India.

I do not accept this thesis. First of all, it does not take account of the large differences in levels of productivity that are behind the larger bundles of goods and services constituting the national incomes of the United States and other industrialized countries; and levels of productivity, while not necessarily synonymous with levels of welfare, do in fact constitute one of the most significant and relevant constituents of economic welfare. Secondly, I do not believe that this so-called difference in attitudes to wants between, e.g., India and the United States really exists on the scale imagined; and, to the extent that it does, it is, largely speaking, not of a static or permanent character resulting from some deep-rooted tendencies of the Indian people but is the result of ignorance and lack of education to some extent, but much more the result of lack of opportunity. This is clear from the fact that there are people in India whose wants, as expressed either in the magnitude or in the variety of their demand for goods and services, can stand comparison with any group of people in the United States; and if the bulk of the

population cannot share these wants, it is because they are poor and do not have the opportunity to do so. In fact, this absence of demand on their part is indicative of the low level of the country's real income rather than the result of the impact on economic activity of any basic national attitude in favour of plain living and the limitation of wants. I am not inclined, therefore, to make any allowance for so-called differences in national attitudes to wants in general in comparing the real national incomes of industrialized and under-developed countries. At the same time, I do think that income originating from commercial advertising does contain an element of grossness. It is, however, not possible to suggest its exclusion from the national incomes of both types of countries, as it does reflect a certain measure of addition to economic welfare in the form of final services to consumers. Under the circumstances, the only possible conclusion that can be advanced is that the larger presence of income from advertisement in the national incomes of the industrialized in contrast to those of the under-developed countries probably is a factor making for some over-estimation of the real income of the former.

To sum up, when we link up national bundles of goods and services with economic welfare, even though provision may be made for identity of treatment of each item, or for necessary adjustments in regard to the items to be excluded or included, we find that differences in national bundles do not necessarily reflect equal differences in economic welfare. In fact, we find that as between industrialized countries and under-developed countries, a part of these differences are the result just of difference in conditions, physical or social, and do not represent differences in welfare. A part of the differences is due to the larger prevalence of goods and services intended for harmful or unhealthy consumption in the industrialized countries and therefore indicate a certain measure of over-estimation in their real national incomes; and a part of the difference is due to the larger presence of income from advertisement in the industrialized countries, and as this item includes a gross element which is not deducted in computations of national incomes, it leads to a certain measure of over-estimation in the real incomes of these countries. Finally, the contention that differences in national attitudes to increasing of wants are responsible for over-estimation of real incomes in the industrialized countries

is not accepted. The general conclusion arising from the discussion in this section is that the differences that exist between the real national incomes of industrialized countries and under-developed countries are somewhat less than the differences in their national bundles of goods and services represented by their national incomes. Thus, for example, the people of India are not as badly off in terms of economic welfare in comparison to the people of the United States as may be inferred by the difference in the quantum and quality of the national bundles of goods and services that constitute their respective national incomes. The caution is added that this conclusion is not equally applicable to a comparison of their levels of productivity.

V. PROBLEMS OF VALUATION

So far we have been considering the question of comparability in real terms or in terms of economic welfare of the national bundles of goods and services constituting the national incomes of industrialized and under-developed countries. We had thus assumed away the problem of comparability arising from the fact that bundles of goods and services cannot be constituted except in terms of their money value, which gives rise to the whole question of valuation that underlies the computation of national incomes. This question is important not only from the point of view of translating a given country's national income in terms of economic welfare, but also from the point of view of comparing the real national incomes of two different countries. The problem for consideration in this section is whether the methods of valuation adopted in industrialized and under-developed countries vary so much as to give rise to differences in the value of their net national products that do not correspond to what may loosely be described as their national bundles of goods and services that we have been discussing in the previous three sections. The question of the ratio of exchange which is employed to convert the money income of one country into that of the other and its relevance to the problem of comparability of real national incomes is left over to the next section.

The most important of such problems that arise under valuation of the net national product are:

(1) Imputed valuation of goods and services not entering into marketed output;

(2) Valuation of governmental services;

(3) Valuation of other services, such as professions, liberal arts, and domestic service.

There is also the somewhat different but equally important problem of regional differences in value, output and real income within one country as compared to those in another.

Let us take the question of imputation first. Imputed values usually pertain to three broad categories, viz.: (1) Home produce consumed by the farmer; (2) wages or other payments in kind, and (3) net rental of owner-occupied houses.

It is important to observe that imputed value forms an important constituent of the national income of even the industrialized countries. The following statement quoted by Dr. Margaret Reid from the Survey of Family Spending and Saving in War-Time of 1941[1] is relevant in this connection:

TABLE II

Per Person	Urban	Rural Non-farm	Rural Farm
Money income . . . . $	792	390	281
Non-money income . . . $	56	68	129
Percentage of non-money income to money income . . . . %	7	17	46
Percentage of units reporting income in kind . . . . . %	91	98	100

The value of home-produced output not entering into marketed output, including payments in kind, is calculated in both industrialized and under-developed countries, on the basis of farm prices or sale prices at centres of production. Does this lead to an under-estimation of real income? The question gets added importance because of the large place which such imputed valuation of non-marketed produce occupies in the case of the under-developed countries. From the point of view of the cultivator and the non-cultivator in India, the money value of the former's income does contain an element of under-estimation as compared to that of the latter in terms of quantities available of the produce concerned. But does it also contain an element

[1] Margaret G. Reid, Distribution of Non-money Income, *Studies in Income and Wealth*, Vol. XIII, *op. cit.*, p. 136.

of under-estimation in terms of economic welfare? I am not sure that it does. The man who purchases food grains or any other produce does pay a higher price than the farmer's sale price; but he also gets a larger measure of choice. Very often he also gets additional conveniences. In other words, he gets a larger consumer-income than the farmer gets, even though he may not be consuming a larger quantity. I think the difference in the retail price of marketed output and the farmer's sale price of non-marketed output is somewhat analogous to the difference in quality that accounts for the difference in the prices of different units of what is described as the same commodity. There is a genuine economic justification for the difference between the price at which a producer sells his output, and that at which he buys it; the latter includes a definite economic service which the former does not, and it is not correct to impute it where it does not exist. I am therefore of the opinion that the price which should be used to impute the value of non-marketed output should be that at which the producer would sell the commodity concerned and not that which is paid by other consumers who have to purchase it in the market. I think the same logic is applicable to the valuation of payments in kind, because here again the worker, who gets paid in kind, gets a smaller consumer income on account of absence of choice and other conveniences. I think therefore that the national incomes of countries which contain imputed values of non-marketed output of commodities on the basis of producer prices do not suffer from an under-estimation of real income on that account.

The net rental of owner-occupied houses is a difficult problem in valuation, especially when applied to rural houses in under-developed countries, where sale or marketing of house room is practically an exception. The rental value is therefore arrived at, in the case of India, e.g., by applying a gross yield of 6 per cent on the estimated value of rural houses and deducting therefrom the estimated annual expenditure on maintenance and repairs. In industrialized countries the methods followed are not the same; it is usual to impute net rentals of owner-occupied houses by taking the net rentals of houses which are actually rented, this being possible by the greater prevalence of a market economy in the realm of residential accommodation. What difference the choice of these different methods of valuation makes to the real income of the countries concerned is difficult

to answer on an *a priori* basis. All that can be said here is that net rentals of owner-occupied houses in the national incomes of under-developed countries are on a somewhat different value basis than other items, and to that extent create difficulties in regarding their national income totals as approximations to their sum totals of economic welfare. In my opinion, this item of net rentals of owner-occupied houses in under-developed countries represents a greater difficulty in the way of comparability of their real incomes with those of industrialized countries than the factor of non-marketed output of commodities on which stress is usually laid by writers on the subject.

The valuation of governmental services presents great difficulties in drawing inferences regarding economic welfare, as governmental services usually constitute a monopoly, and there is therefore no such thing as a free market valuation of these services. This, however, is true of all countries, though difficulties in comparability arise because the rates at which these services – some of them quite identical – are valued in the different countries. Difficulties in comparability also arise because of the greater rôle of governmental services in the industrialized as contrasted with the under-developed countries. But looking at it from the point of view of each country, governmental services are valued on a similar basis, i.e. a basis of public policy and not on a market basis. This therefore presents no special difficulty, except insofar as the valuation of governmental services in some countries are on the basis of higher prices for them as compared to other sectors of the economy than in other countries. This, e.g., would be true of India as compared to the United States, and I think the same would be generally true of under-developed countries which are or have been under foreign rule in recent times.

The valuation of professional services and of domestic services do raise difficult problems because they are not subject to the same type of market economy as commodities. In many cases, the sellers of these services follow the practice of discriminating monopoly. In most cases the prices of these services reflect the general level of the national income in each country much more than commodities. These facts, however, are true of each country. Difficulties in comparison are, however, created by the different values which are put on identical services in the industrialized and under-developed countries. This question will be taken up in the next section.

As regards regional differences of the real income attributable to money values within the country itself, there is no doubt that this does create difficulties in inferring economic welfare from the money totals of such incomes. This difficulty is, however, common to both the industrialized and the under-developed countries. The usual assumption that the real income attributable to a given money income differs much more in the under-developed countries on this account is not correct in actual fact. It is true that the insufficient development of large-scale production, standardization, and transport facilities does make for significant ranges in prices in the under-developed countries; but advertisement, social standards, and differences in income levels which prevail on a much larger scale in the industrialized countries also make for significant ranges in prices within those countries, though sometimes these may be concealed behind apparent quality differences. Similarly cost differences due to climatic differences prevail as much in the under-developed as in the industrialized countries, depending upon the size of the country and its general geographical position. Under the circumstances, the fact of regional differences within the country does not appear to create a problem that is peculiar to under-developed countries in relation to industrialized countries.

To sum up, national incomes of both the industrialized and the under-developed countries include imputed values of non-marketed output, value of governmental services, and value of professions and domestic servants. In view of the fact that the valuation of these items is not strictly determined by principles of market economy, they do create difficulties of interpretation regarding their contribution to national economic welfare as compared with those of other constituents of the national product. Difficulties are also created on this account in the field of inter-country comparisons of real incomes; but there seems to be no way of making any statistical or quantitative allowance for this factor, except to mention it when it assumes significant proportions.

VI. RATES OF EXCHANGE

We have dealt in the previous section with the difficulties that arise even in the case of each individual country in treating its

national income as an index of economic welfare because of the differences in methods of valuation applied to some of the constituent items. We have also seen that this gives rise to difficulties in inter-country comparisons even if the national incomes concerned were originally quoted in the same currency. In fact, however, different countries have different currencies and the money totals of their national incomes have to be converted into the currencies of the one or other as the case may be in order to institute comparisons. The legal ratio of exchange between different currencies is used for this purpose; and it is this which perhaps presents the greatest difficulty in the way of inter-country comparisons of real national incomes, especially as between industrialized and under-developed countries. The problem also prevails between the industrialized countries themselves, but it exists to an even larger extent between the industrialized and the under-developed countries. Obviously the exchange value at par, say, of the Indian rupee and the American dollar does not express in any absolute sense or in terms of economic welfare the ratio of value between the two currencies; and yet it is this par value which is used for converting the national income of the one country in terms of the currency of the other for purposes of comparison. Everyone recognizes the difficulties that this gives rise to, but so far no satisfactory attempt has been made to find an alternative ratio of exchange for use in connection with inter-country comparisons.

It is usual to think of purchasing power parity as the answer to the question of formulating a suitable ratio of exchange for equating national incomes expressed in different currencies. There are, however, several snags in this procedure.

To begin with, the commodities and services entering into the national income are not identical for different countries. This is particularly true of industrialized and under-developed countries, the items entering into the national incomes of the former being more numerous and varied than in the case of the latter. Any attempt, therefore, to use inter-spatial deflation on the basis of price-index data for broad categories of goods and services is unsatisfactory because it necessarily fails to cover important items of consumption within the categories.

Secondly, there are important quality differences between commodities and services that are apparently identical, which invalidate a straight comparison of their price ratios. This is

particularly true of industrialized countries in relation to under-developed countries, difference in comparative levels of welfare often taking the form of better quality rather than greater quantity in the case of the former. This may be illustrated by comparing food consumption in these two types of countries. Taking, for example, the United States and India, it would appear in terms of calories or of proteins that the per capita consumption in the former country is no more than twice that in the latter. In actual fact, the difference is significantly larger on account of the much better quality of food consumed in the United States. This is clear from the fact that 'original calory' equivalent or the equivalent in terms of the quantity of cereals used either directly or indirectly for food consumption in the United States is more than four times that in India. Numerous other instances of quality differences can be drawn from a comparison of articles bearing identical nomenclature consumed in the two countries. This makes therefore for a further limitation on the validity of purchasing power parity as a correct ratio of exchange for inter-country comparisons of real income.

Then again, the prices of 'final' services vary greatly as between different countries, especially as between industrialized and under-developed countries. A straight price comparison becomes difficult not only because the quality of the services concerned varies so greatly but also because of the large number of services that are peculiar to each country and find no parallel in the other. Generally speaking, the purchasing power parity of the dollar in terms of the rupee would be lower than the legal ratio of exchange in the case of domestic and professional services than it would be in the case of essential goods; and the purchasers of services in India who belong to the middle and richer classes would be better off than the dollar equivalent of their incomes would indicate. On the other hand, the sellers of services in India, especially middlemen, professional people and government officials, are relatively better off by comparison with their counterparts in the United States. This constitutes yet another limitation on the formula of purchasing power parity.

There is also the significant differences that exist in the purchasing power of the domestic currency as applied to rural and urban classes or to different income groups. This creates complication in inter-country comparisons. Thus, for example, the purchasing power parity of the dollar in terms of the rupee

would be different for rural classes in the two countries as compared to urban classes; it would be different for the working classes as compared to the middle and the richer classes. And finally there is the purely statistical difficulty of lack of adequate availability of data regarding prices, items and weights to be attached to each item.

All this makes difficult the adoption of purchasing power parity for making inter-country comparisons of real national income. Nevertheless, it is necessary that more research work should be undertaken in this field, and comparative data collected regarding number, quantity, and prices of articles and services consumed, and by different centres, classes and income groups in both industrialized and under-developed countries. This requires collaboration between research workers in different countries. I hope that it will be possible to have such studies undertaken through the good offices of the International Association for Research in Income and Wealth. I also hope that the Statistical Office of the United Nations Organization would turn their attention to this fruitful field of international research.

Before concluding this section, I would like to make a brief comment on the variation that exists between the par value of exchange between the currencies of industrialized and under-developed countries and their purchasing power parity ratios in whatever manner the latter is calculated. While I do not have comprehensive data to support my conclusion, I have no doubt that, even after allowing for quality differences, a substantial number of goods entering into the national incomes of under-developed countries are valued at prices which are considerably below those of corresponding goods in the industrialized countries, if translated in terms of the currencies of the latter. This is true to an even larger extent in the case of the prices of services. The conclusion follows that there is a considerable measure of under-estimation of the real incomes of under-developed countries as compared to those of industrialized countries if we use the legal ratio of exchange to reduce them into common currency units. The extent of under-estimation of real per capita incomes will, of course, be different for different centres in the two types of countries as also for different income groups.

VII. CONCLUSIONS

I shall now sum up the main points in this paper on the question of comparability of the real national incomes of industrialized and under-developed countries.

I have dealt with the national income under two heads, viz. volume and value. Taking volume first, I have discussed the question of excluded items – which goods and services are excluded from the national income computations of either or both these types of countries and how this exclusion affects comparability of real income. The vexed question of household services has been dealt with, and the conclusion arrived at that, while the nature of the services produced by the household for self-consumption is not the same in both industrialized and under-developed countries, yet in terms of volume and imputable value such services form a significant part of activity in both types of economies. I have held therefore that, contrary to the opinions usually expressed on the subject, the exclusion of domestic service and other types of household services produced for self-consumption from the national incomes of under-developed countries does not make for any under-estimation of their real national incomes as compared to that of industrialized countries.

It has been pointed out that, on the other hand, the exclusion of the imputable income attributable to durable consumption goods from the national incomes of both these types of countries leads to an under-estimation of the real income of the industrialized countries, as durable consumption goods occupy a much more important place in their economies. The same is also true of the exclusion of the imputable value of public buildings from the national income of these countries.

I then examined the items included in the national bundles of commodities and services of these countries, especially the service items, with a view to seeing whether they include any element of grossness. Reference has been made to services which really constitute cost items for an industrial society and I have suggested that their inclusion makes for a certain measure of over-estimation of the real income of industrialized countries.

Next these national bundles have been examined with a view to seeing how far the commodities and services included therein correspond to equivalent levels of economic welfare. This in-

volved an examination of the nature of wants, the volume of commodities or services required to satisfy wants of a similar character in the two types of countries, the extent of a welfare diminishing element in the respective wants and the whole question of national attitudes, if any, to wants in general and their increase. Finally, I have drawn the conclusion that, on the whole, a consideration of these questions reveals the presence of an element of over-estimation of real income in the case of the industrialized countries as compared with the under-developed countries.

The question of valuation was then taken up, both from the point of view of each individual country and from that of the comparability of their real incomes. I have pointed out that the national incomes of both types of countries include imputed values of non-marketed output as well as non-imputed values of output, such as governmental services and the services of the professions and of domestic servants, which do not properly operate under a market economy. The conclusion is advanced that while these items create difficulties in the way of regarding each national income as an indicator of an absolute level of welfare, they do not, by themselves, substantially affect the comparability of their real incomes. The same is also true of the regional price and consumption-cost differences that exist in the two types of countries.

Finally, the effects of using the par value of exchange for expressing the respective national incomes in terms of a common unit on the comparability of their real incomes has been examined. The conclusion is advanced that the national incomes of industrialized countries contain an element of over-estimation in the values assigned to their output of commodities and to a larger extent in the values assigned to their output of services as compared to the under-developed countries.

The general conclusion arising from the paper is that comparisons of the money national incomes of industrialized and under-developed countries expressed in terms of the currency units of either do definitely conceal a significant element of over-estimation of real income in the case of the former as compared to the real income of the latter. This does not mean that the national incomes of the latter need to be inflated in order to make them comparable with those of the former, though it does mean that the national incomes of the former need to be

deflated. In other words, the industrialized countries are not as 'well off' or as 'much better off' in comparison with the under-developed countries as may appear to be indicated by the comparative magnitudes of their national incomes. It is extremely difficult to give a statistical connotation to this over-estimation of the real incomes of the industrialized countries, though it is possible to throw more light on it by detailed studies of a type that have not yet been undertaken. At the same time, the over-estimation does exist in terms of real income. It is doubtful, therefore, if a useful purpose is served by putting forward figures of comparative national incomes, especially of the industrialized and under-developed countries as is being done in current U.N. publications. It is suggested that a more useful purpose will be served if direct comparisons of real income are attempted by comparative figures of consumption, productivity and the like instead of resorting to national income totals. Here is a fruitful source of study which may well engage the attention not only of the members of the Association but also of the National Income Unit of the United Nations Statistical Office.

9

USES OF NATIONAL INCOME ESTIMATES IN UNDER-DEVELOPED AREAS

by Daniel Creamer

I. CHARACTERISTICS OF UNDER-DEVELOPED AREAS

In discussing the uses of national income estimates in under-developed areas, I shall follow accepted tradition by indicating briefly what I mean by 'national income', 'estimates' and 'under-developed areas'. Let us consider first 'under-developed areas'.

There is a greater area of agreement in the identification of under-developed economies, which, incidentally, can be made without the existence of, or reference to, national income estimates, than in the identification of the economic and social characteristics that define the status of being under-developed. This agreement stems perhaps from the vastness of the regions that must be categorized as under-developed on the basis of Western standards. In fact, all the lands of the world, with the exception of northern, central and western Europe including Great Britain, the United States, Argentina, Uruguay (perhaps), Japan and the self-governing dominions of the British, are characterized by such low per capita levels of reproducible wealth and hence of goods and services that they must be classified as under-developed, or less euphemistically, backward regions. Even this listing exaggerates the extent of the developed areas since it assumes that all parts of each of the nations mentioned have achieved a highly developed economy – Mississippi as well as Pennsylvania.

Obviously not all the backward areas can be said to have a market economy in which the majority of transactions are effected by a medium of exchange. I believe that for such primitive economies, based on self-sufficient 'households' or direct barter of goods and services, national income estimates have severely limited applicability, and if estimates are contrived for such inarticulated economies, they can have but little economic meaning.

Even limiting the subject to backward areas with market economies, the characteristic features of under-development are

not easily determinable because of the heterogeneity of the areas concerned, both economically and socially. This heterogeneity is an evident fact which is frequently overlooked.

The following statements recur as descriptive generalizations:

(1) These areas are producers of raw materials, products of agriculture or of the mines, and each area is dependent upon the production of a single commodity.

(2) This production is predominantly under the control of absentee owners who operate through large corporate enterprises. Where the single commodity is a product of monoculture, huge corporate plantations owned by outsiders coexist with small peasant plots.

(3) Because of the dependence upon a single commodity, foreign trade is a relatively high percentage of the total trade of the area.

(4) Their political status is that of colonialism which entails, among other things, either economic concessions to the metropolitan interests or subsidies from the metropolitan government and the coexistence of two widely differing cultural communities with virtually no contact between them.

(5) High ratio of population to arable land.

(6) Low literacy rate.

(7) Low reproducible capital per head of population.

It is my contention that only the last characteristic is common to all under-developed areas, and although it can be found in conjunction with a large variety of combinations of other economic and social characteristics, it is this low ratio of capital to population that is the essential economic characteristic of a backward area. When this condition is not present, the area, by definition, is not under-developed.

The mere mention of the extreme variation in geographic coverage suggests also the absence of homogeneity among under-developed regions: these regions vary from a continent (Asia) to a few mountain peaks that emerge above the ocean's surface (the U.S. Virgin Isles).

In dealing with under-developed countries, then, we are concerned with highly heterogeneous units of population and land

areas which share only one common characteristic – low amounts of reproducible capital per head of population.[1]

II. NATIONAL INCOME ESTIMATES

We can indicate more briefly what meaning we give to 'national income' for we shall use 'national income' as a shorthand expression for net product, including major components, and related estimates including social accounts and national plans or budgeting, and distribution of income by size of income. Indeed, it should be understood as encompassing the whole gamut of estimates that is reported on in the Bibliography of this Association.

An 'estimated' figure is distinguished from a 'guessed' figure by a smaller margin of error and this results from basing the estimate on data. How small the margin of error will be depends primarily on the accuracy and completeness with which the underlying data have been compiled and tabulated; the competence and the imagination of the estimator are secondary. The legitimate uses of national income estimates will vary not only with their accuracy but also with the degree of articulated detail with which estimates can be prepared. Clearly the greater the detail, assuming it to be reasonably accurate, the more numerous the uses. Unfortunately, the estimates in under-developed countries, with few exceptions, are not firmly based on reliable census or tax data or on well-designed sample inquiries.

This judgment finds support in the classification of current estimates of 61 countries undertaken at my request by the National Accounts and Financial Statistics Branch, Statistical Office, United Nations. Following Colin Clark, this Office appraised each estimate according to the following scale:

Class I. Based on accurate taxation or production census statistics.

Class II. As above, but with some defects or deficiencies.

Class III. Approximate estimates.

Class IV. Very rough estimates.

[1] It is tempting to add one other attribute as common to all backward areas the absence of the 'capitalistic spirit' which some identify with the 'Protestant ethic'. To pursue this sociologist aspect of the problem would lead us too far astray.

When the 61 countries are divided into developed and under-developed economies, we find a sharp contrast in the character of estimates.[1]

	No. of Economies	No. of Economies with Specified Class of Estimate			
		I	II	III	IV
Developed economies	24	11	10	3	—
Under-developed economies	37	1	12	15	9

Because of the approximate and rough character of much of the underlying data, estimators with high standards of 'statistical ethics' are obliged to forego estimating the detailed components that enter into the global estimates. The remainder of our discussion, however, will consider the uses of national income estimates on the assumption that these severe limitations of existing national income estimates have been eliminated in large part; otherwise there would be little to discuss. For this reason we shall frequently draw for illustrative purposes on the estimates for Puerto Rico, since these estimates are reasonably well founded on census and tax data and have been prepared in considerable detail.

III. POLICY USES OF INCOME ESTIMATES

The economic problem of transforming backward areas, in our view, is one of effecting a lasting and continuous rise in the ratio of reproducible capital to population. That is, it is a problem in economic growth, and backward areas constitute only a special case. Now the rôle of national income estimates in studying the process of economic growth, another topic discussed at this Conference, would apply also to the rôle of these estimates in studying the development of the under-developed areas. Such uses obviously would not be unique with the under-developed countries. However, I am led to conclude that no matter what economic aspect we consider, the uses of national income estimates will not be solely applicable to the problems of backward nations.

[1] The subjective element in the evaluation of the estimates and in the classification of the economies is readily admitted.

Professor Simon Kuznets has well stated the general purposes so eminently served by national income and wealth estimates when he notes that one of the motivating considerations in preparing these estimates represents 'the effort by economists and other students of human society to perceive the economy of the nation as a whole; to define the particular aspect that reflects in clear focus its essential functions and structure; to distinguish its major components – groups of economic agents and types of economic activity; and to find a basis upon which both the parts and the whole can be measured to secure comparable magnitudes'.[1] The uses being general by definition mean they are not unique for any particular type of economy; they are relevant to an equal degree to under-developed as well as industrially advanced economies.

This fact is cited not with the intention of minimizing the uses of national income estimates in under-developed areas. Lack of uniqueness does not impair the contributions of these estimates in delineating economic structure, in summing up the whole economy, in distinguishing significant components and relating them to the whole.

To the extent that under-developed economies are less complex than industrially advanced economies, much will be known of the structural and functional anatomy of the economy by other means of economic observation – census of occupations, roster of exports and imports, etc. Accordingly relatively less knowledge on this score will be contributed by national income estimates. But even in such areas with a relatively simplified economic structure, to gain a summary notion of approximate changes over time in the per capita level of economic well-being, national income and wealth estimates are indispensable. It is probably safe to say that this last use – as barometer of changes in economic well-being – is especially important in those under-developed areas where development programs are being implemented. The temporal changes recorded in the income and wealth estimates provide a rough measure of the effectiveness or ineffectiveness of the programs, if the effect of changes outside the program can be broadly gauged or isolated.

Income estimates relating both the parts and the whole in a

[1] Introduction to the *Bibliography on Income and Wealth*, Vol. I, 1937-47, International Association for Research in Income and Wealth, p. xi, Bowes & Bowes, Cambridge, 1952.

meaningful way make it possible to provide a factual basis for political debates. In Puerto Rico, for example, prior to the development of the income estimates, the belief that absentee owners, chiefly residing in the continental United States, controlled a substantial fraction of the Puerto Rican economy figured prominently in the political and economic thinking of many responsible groups. An approximate measure of the magnitude of absentee ownership can be obtained by relating the net flow of interest, dividends and profits of branch establishments, which in Puerto Rico for the last decade has been an outward flow, to the national income produced on the Island. This calculation for Puerto Rico, based on data that are biassed in the direction of overstating the net outward flow, indicated that the net external flow of property income was less than 5 percent of the net income produced in Puerto Rico during the decade of the 1940's.[1]

Another topic of public discussion was the extent of the contribution by the U.S. Federal Government to the Puerto Rican economy through unilateral grants, subsidies and other activities. National income accounts contributed in two ways to establishing this discussion on a factual basis. First, in the process of constructing the accounts accurate compilations of the large variety of Federal grants and activities in Puerto Rico were derived, and secondly, the relative magnitude of this total could now be indicated by relating it to the appropriate national income total.

Because national income estimates provide 'a basis upon which both the parts and the whole can be measured to secure comparable magnitudes', these estimates were a most valuable aid to the political leaders, and through them to the people of Puerto Rico, in assessing the economic price of any basic change in the Island's political relationship *vis-à-vis* the United States. For example, the more obvious impacts of complete political independence or statehood upon the Puerto Rican economy are

[1] For the underlying data, see Daniel Creamer, *Net Income of the Puerto Rican Economy, 1940–44* (1947), and Jesus Diaz Hernandez, *The Net Income of the Puerto Rican Economy Fiscal Years 1939–40 to 1945–46* (Bureau of the Budget, Office of the Governor, San Juan, Puerto Rico, 1949). This compares with 4 percent for Jamaica, 12 percent for Nyasaland and 42 percent for Northern Rhodesia according to estimates of Phyllis Deane, *The Measurement of Colonial National Incomes*, Occasional Papers XII, National Institute of Economic and Social Research, Cambridge University Press, 1948, Table 105, p. 149.

known and can be roughly measured.[1] Once measured and related to the national income total it was clear that the current relationship provides the most favorable economic terms for Puerto Rico.

It may not be amiss to cite two other examples of how national income estimates have assisted responsible political leaders in Puerto Rico to attain a better understanding of some of their problems and the validity of proposed solutions. The annual rate of natural population increase in Puerto Rico during the 1940's was 1.7 percent, one of the highest rates in the world. The rationalization of a lack of a program for reducing the birth rate, admittedly an extremely difficult problem, was found in the comforting belief that the population problem would solve itself when wage-earner families attain a level of annual income of $700–800 in prewar prices. Let us assume that the proposition is a valid one and that the wartime rate of expansion in real per capita income, which was at an uniquely high rate in the recent history of Puerto Rico, continues. How many years must elapse before the stated level of family income is reached? What will be the expected population at that date and what is the real national income implied by the given level of family income and expected population? Rough calculations indicate that it would require 18 years to achieve the required family income, that the Island's population in the meantime would increase by 40 to 50 percent and that the foregoing implied a tripling of the real national income of 1942. The most sanguine are ready to admit that the resource base (arable land, raw materials and labor force) is such as to make this achievement highly improbable.[2] To deprive the political and intellectual leaders of their rationalization may be a preliminary to positive action, which is yet to be taken.

The other example illustrates how quantitative limits can be assigned to the economic impact of a given reform. Among the several programs in Puerto Rico designed to improve the economic well-being of the farm laborer, one involves the purchase

[1] An estimate of the loss of income that probably would result from complete independence is attempted in *The Net Income of the Puerto Rican Economy*, *op. cit.*, pp. 39–41.

[2] This calculation is carried out in Creamer, *op. cit.*, pp. 23–25. The results presented there must be modified in the light of the more accurate deflation presented in the *Gross Product of Puerto Rico, 1940–1944*, by Daniel and Henrietta Creamer, University of Puerto Rico, 1948, pp. 71–72. These modifications are taken into account in the text statements above.

by the Land Authority of sugar lands held by corporations in excess of 500 acres. These plantations, called 'proportional profit farms', are operated by Land Authority managers and the profits are divided among the farm workers in proportion to manhours worked by each one. The distribution of the net profits among the workers constitutes a deliberate attempt at a redistribution of income. It is the potentialities of this phase of the program which can be gauged in income terms.

Since the following are known (say) for 1939–40:

(*a*) Total acreage in sugar cane;

(*b*) Total acreage subject to expropriation under the legislation;

(*c*) Net profits earned in the cultivation of sugar cane;

it is a simple matter, on the assumption of equal productivity in the cultivation of public and private lands, to calculate the amount of net profits in 1939–40 that would have been received by the workers on the 'proportional profit farms'. My calculations indicated that about 2 percent of Puerto Rico's national income would have been redistributed in 1939–40 had this program operated at maximum level. The worthwhileness of this program obviously cannot be settled by a simple computation of this sort. It is helpful, however, to be able to assess the quantiative importance of one of the avowed objectives of the program. With national income estimates an approximate measure can be made.

The desire to measure a part of the economy and relate it to the whole assumes unusual force in those under-developed economies where different cultural communities coexist. How is the income distributed between the two communities? What is the relative burden of taxation between such communities and what is the relative distribution of government expenditures? Dr. Ludwig Gruenbaum was able to carry out such estimates for the Arabic and Jewish communities of Palestine under the British Mandatory Government for 1936, thereby providing a factual base to an important political discussion.[1] And most of us are familiar with Miss Phyllis Deane's estimates of the dis-

[1] A. Ludwig Gruenbaum, *National Income and Outlay in Palestine, 1936*, Jerusalem, 1941.

tribution of national income between different races or sectors (Europeans, Africans, Asiatics and government) in Northern Rhodesia and Nyasaland.[1]

Estimates of income for partial segments other than cultural or racial communities may be significant depending on the circumstances. For example, those interested in the development of the Israeli economy would have a special interest in knowing the fraction of total national income and of specific industries originating in establishments owned and operated by the General Federation of Labor (Histradruth) and how this fraction changes over time. Similar estimates for the firms operated by the Puerto Rican Development Company have had a special interest for Puerto Ricans.

This type of use of national income estimates obviously is not unique with under-developed areas for it does not differ in principle from the practice of preparing regional breakdowns of national or personal income in the developed economies – state estimates of personal income in the U.S.A., for example. Nor can we find unique uses in the possibly legitimate rôle of income estimates in creating and furthering economic developmental processes themselves.

Now, it is a commonplace that the allocations of resources in a national economy are determined either (1) predominantly by the central government (totalitarian economy) or (2) partly by the central government and partly by the decisions of private individuals acting through the market (mixed economy) or (3) predominantly by the market transactions of private individuals (private market or *laissez-faire* economy). Prior to the Russian revolution of 1917 national economies developed into advanced industrialized nations by following paths (2) or (3). The industrialization of Germany and Japan illustrates development by a mixed economy and the industrialization of Great Britain and the United States by a predominantly *laissez-faire* economy. In the future it is unlikely that under-developed areas will develop by following the principles of *laissez-faire* where state direction is at a minimum. Rather they will develop as mixed or fully regimented economies. Expressed in the more illuminating terminology of Professor Jewkes they will be characterized either as ' ''assisted'' transitions to industrialization in the sense that state intervention (is) limited either in extent or time and where,

[1] Deane, *op. cit.*, Table 106, p. 150.

normally, investment (is) provided, at least in part, from outside' or as ' ''engineered'' transitions where the state provides most of the driving force and deliberately organizes the sacrifices necessary for investment'.[1] Even if non-economic considerations should not intervene, state intervention is bound to be above the minimum to overcome the disadvantages of a late start. This factor was partly responsible for the 'assisted' transition of Germany and Japan in the latter half of the nineteenth century and it must operate with greater force a century later.

State intervention above the *laissez-faire* level will emerge for still another reason – to create the economic and cultural prerequisites for development, no part of which will prove attractive to private investors, certainly at the outset. Thus public health programs to rid populations of enervating diseases, educational programs to make populations literate – a preliminary to vocational, technical and professional training – systems of transportation and communication and development of power, all are bound to become the responsibility of the state and in this manner call into being an assisted transition or mixed economy.

When non-economic objectives are paramount, the industrialization process is more likely to be 'engineered', or totalitarian, in character. That is, industrialization in such cases is not primarily directed to raising the level of economic well-being but it is regarded as a means of achieving political goals – such as the absorption of a larger population by Israel for reasons of nationalism and self-defense or the fulfillment of communist dogma as in China. Virtually all efforts in such cases must be controlled and directed toward the attainment of these objectives.

In the case of an engineered transition by the state the rôle of national income estimates in the form of social accounts seems clear. If complete chaos is to be avoided, planning in the form of detailed social accounts is indispensable and the targets established in these accounts assume an imperative character for the various administrative agencies of the state.[2] Accordingly, it is no accident that the Israeli Government has issued a

[1] John Jewkes, The Growth of World Industry, *Oxford Economic Papers* (New Series), Vol. 3, February 1951, No. 3, p. 6.

[2] Gerhard Colm, Experiences in the Use of Social Accounting in Public Policy in the United States, *Income and Wealth Series I*, published for the International Association for Research in Income and Wealth by Bowes & Bowes, Cambridge, England, 1951, pp. 75–98.

detailed four-year development plan prepared by Dr. Gaathon.[1] Whether the imperatives can be heeded depends on how intelligently they have been formulated and how well the economy is insulated against factors that originate outside of its own borders. However, it must be emphasized once more that this use of national income estimates is common to all 'engineered' economies whether they be developed or under-developed.

In the case of an 'assisted' transition the formulation of a set of social accounts can serve as orientation, as Colm says, for governmental authorities, especially with respect to fiscal policy.[2] And fiscal policy could have an important rôle to play during the transitional period because of the inflationary pressures that will be created by the relatively large investments based primarily on foreign loans or grants. Again, however, it is necessary to point out that such use of income estimates is not unique with under-developed economies.

If the basic characteristic of under-developed areas is the small amount of capital per worker, the problem in its simplest terms, as previously noted, is one of increasing the amount of capital per worker to a sufficiently high level and on a sustaining basis. In other words, the problem that transcends all others in importance is how to discover the specific opportunities for profitable investment. The type of economic analysis that holds out any hope of providing some of these answers obtains little help from national income and related estimates. The categories of the latter are simply not relevant to the analysis of the economics of location of industry.

Of the various analyses of the industrialization of backward areas that have come to my attention the one by Professor W. Arthur Lewis for the British West Indies, in my judgment, provides the keenest insights.[3] Yet the analysis has not a single reference to the national income estimates of the area and I believe this omission in no way reduces the effectiveness of his analysis. Not only do national income estimates have little to

[1] A. Ludwig Gaathon, 'Four Year Development Plan of Israel, 1950–1953', Prime Minister's Office, Department of Economic Research, Hakirya, March 1950 (mimeographed).

[2] Several of the papers presented to the Cambridge meeting of this Association on social accounting conclude that among the primary functions of social accounting is the guidance it provides on fiscal policy. See particularly the papers by Erik Lundberg and E. F. Jackson. The latter is published in *Income and Wealth Series I, op. cit.*, pp. 148–59.

[3] The Industrialization of the British West Indies, *Carribean Economic Review*, Vol. II, No. 1, May 1950, p. 61.

contribute to this crucial area of research, but income estimates in the form of projected social accounts (national plans or budgets) cannot have any claim to being valid targets unless this fundamental research has been done.[1]

If these judgments are correct, is there not some danger that specialists in national income estimates may have been too zealous in promoting their specialty with the governmental authorities in under-developed areas? Since all these areas are characterized by scarcity of professional personnel at the service of government, perhaps relatively more resources should have been devoted to fundamental economic analysis and less to national income estimates. On occasion one senses the existence of the naïve belief that economic salvation can be achieved by the creation of statistical measures. Some are prone therefore to pay too high price for acquiring the measurements. In Puerto Rico, for example, a systematic analysis of investment opportunities on a continuing basis is only now being considered. Yet the authorities have seen fit to have prepared an input-output table according to the Leontieff model which has validity only if the industry 'mix' and productivity remain constant. This is a most unrealistic assumption, for an under-developed area can develop only by changing its industry 'mix' and productivity. This particular statistical gadget then probably will have little use. As specialists we can serve under-developed economies also by exercising restraint in promoting our special measurements.

IV. CONCLUSIONS

To the question 'What are the uses of National income estimates in under-developed countries?' our answer, which perhaps is obvious, is that the uses of national income estimates are general, applicable alike to developed and under-developed economies. Specific uses will depend on the degree of accurate detail with which the estimates can be prepared and the econo-

[1] This condition does not seem to have been fulfilled in setting the economic targets in 1960 for Puerto Rico as set forth in 'Economic Development, Puerto Rico, 1940–1950 and 1951–1960', issued by the Economics Division of the Puerto Rican Planning Board (January 1951, mimeographed). One might characterize this type of mechanical extrapolation as the modern version of political arithmetic. By fundamental research I have in mind economic analysis directed toward the determination of specific possibilities for profitable investment and how these possibilities can be developed.

mic circumstances and proposals that are of special interest or significance to a given area. When the available information is sufficient only to approximate the national income total, which characterizes all too often the estimates in under-developed areas, the estimate has only one use – to gauge the changes in economic well-being over time. When the articulation of the economy can be described by estimates of significant components, the uses are extended through the possibility of relating the parts of the economy to a total in a meaningful manner. However, no matter what degree of articulation can be achieved in the national income estimates they cannot substitute for fundamental economic analysis to determine the opportunities for profitable investment, whether by the state or private enterprise. This is absolutely essential if an under-developed area is to be transformed. At best national income estimates can provide some data for the analytical task.

10

TREATMENT OF GOVERNMENT ECONOMIC ACTIVITY IN THE NATIONAL ACCOUNTS

Ingvar Ohlsson

I. INTRODUCTION

1. *The problem*

To some extent the problem of treating government activity in the national accounts is a problem of seeking conformity between our simple analytical tools and the complexity of reality. There is, unfortunately, lack of conformity between economic reality as we assume it to be for statistical purposes and what it really is. Is it not a characteristic feature in our everyday statistical experience that reality does not, and never can, suit our statistical definitions and economic models? Enterprises have a mixed production and cannot be classified into a fixed branch of industry in a desired scheme. Entrepreneurs' incomes cannot be clearly divided between wages, interests and profits because they are mixed in reality.

How much easier it would be to prepare national accounts if every service and every commodity were exchanged in the market. In that case there would be bilateral transactions to record in our accounts. There would always be a financial transaction in the opposite direction of a real transaction. This would give a monetary value, a market price, that could be used to represent the real transaction, that is if one could also believe in the theoretical usefulness of the market price valuation.

The bilateral nature of most transactions has, I think, been of great importance for the development of national income statistics and national accounting. But for activities of the government and some other economic units this easily available basis of valuation is lacking. During the last two decades, however, national income statisticians have been trying to impute a bilateral character to such activities in order to have a more uniform basis for treating these types of economic activity in national income statistics.

This paper is concerned with the problem of incorporating government activity in the national accounts primarily as a

problem of valuation. The solution – if there is one – is considered to be closely related to the purpose for which the accounts are to be used.

In the literature about this problem there seem to be two approaches implied. One is the approach from a national point of view, where real transactions are considered as elements in a general economic process for the nation as a whole. This approach raises such problems as finding and measuring the intermediate product of government activity.

The other approach starts from the profit and loss accounting of enterprises and other economic entities. In this case the financial transactions become important. This may lead to the treatment, for instance, of taxes and fees as payments for services rendered by government and of allowances for bad debts as a negative item (on the expenditure side) when summing up national product.

The problem of accounting for government activity is the same type of problem as arises in the treatment of banking, insurance and other activities, where the financing of the activity is achieved by means unrelated to the market price principle.

2. *Factors behind the accounting design*

In principle there are many ways of making out national accounts. The practical design depends on several different factors, some of the more important of which will be considered briefly here.

The design of the national accounts depends, among other things, on the institutional circumstances in the country for which the accounts are being constructed. It is probable that a statistical survey of the economy of an industrialized country (with various forms of enterprise) would be quite different from that of a country where agriculture is the predominant source of livelihood.

The status of the available primary statistics is another factor of importance for the design of national accounts, although it is possible to influence this factor in the long run. The difficulties encountered by those doing the practical work of obtaining statistics for the various items of the national accounts are evident.

However, the design of the national accounts depends principally on the purpose for which they are to be used. There can

be, and already have been, a number of different fields of application. The accounts are used in the analysis of economic fluctuations, for constructing the national budget, and for the analysis of economic results ('welfare' and 'productivity'). In the latter case they are usually transformed ('consolidated') into national income statistics.

It is possible to think of several other factors of importance for the form of the national accounts; factors the content of which is more or less difficult to determine. Such factors include tradition, accepted international practice and connection with everyday terminology.

When the place of government activity in the national accounts is dealt with in this paper, the above-mentioned factors are handled under the following assumptions. The status of the primary statistics is for the most part left entirely out of the picture. It is hardly of interest at a conference of the International Association for Research in Income and Wealth to allow the form of Swedish primary statistics, for instance, to influence the treatment of a more general problem. The international character of this conference is also the reason why the problem of fitting government activity into the national accounts is not taken up from the any special point of view connected with administration or state finances. Thus, the form of the budget in one country or another will not explicitly affect the evaluation of various national accounting designs.

Regarding the institutional circumstances which may be considered as shaping the economic environment for the problem at hand, it is assumed that besides the government activity there is a comprehensive market economy in the sense that a number of independent economically active private subjects take part in the economic life of the country. They plan production and investments, and choose their consumption relatively freely. The subjects meet in the markets where goods and services are offered for sale. In other words it is an economy typical of a number of countries, including those of Western Europe, America, and others. Of course, it would be interesting to take up the problem from an Eastern European point of view too.

In what follows, the purpose for which the accounts are to be used will become rather important. It will be one of the keys for evaluating the various accounting designs. The significance of the purpose for the design of the national accounts and the

national income statistics has often been stressed by writers in this field.[1] But in my opinion, this point of view has in practice been given too little attention.

II. SOME CONCEPTS USED

1. *Sectors and accounts*

The smallest unit in the national accounts to which economic transactions are attributed is here called, in traditional style, *the account*. Accounts may be gathered together into groups in various ways. It is possible in principle to obtain a pyramid of different groups and combinations of account groups. We shall follow fairly generally accepted practice and use the word *sector* as a composite term for a particular group of accounts. These two types of subdivisions, into sectors and into accounts within each sector, could be used in different ways.

It is rather usual to speak of institutional and functional groupings. In a division by institutional sectors, similar types of entities in the society are dealt with in each sector, each entity organizing economic operations – often with the help of certain capital. Institutional grouping, thus, is made according to the special features of organization. Examples of institutional grouping are the household sector, the joint stock companies' sector and the government agencies' sector.

On the other hand, functional grouping refers mainly to the different stages of the economic process: production, consumption, etc.

It is possible to think of other types of grouping; for example, geographic grouping, such as might apply to the different parts of a country or to a combination of countries, such as the Scandinavian group.

Institutional and functional groupings will be used in what

[1] 'But it cannot be too strongly emphasized that the choice must rest upon the analytic purpose in view rather than any clear-cut distinction between right and wrong', J. Lindeman, Income Measurement as Affected by Government Operations, *Studies in Income and Wealth*, Vol. II, National Bureau of Economic Research, 1938, p. 14. 'In other words there is no necessarily correct form for either the balance sheet or the income statement, although there may be incorrect forms. A form is correct if it shows clearly and accurately what it is intended to show. A so-called general-purpose accounting statement may well be a compromise among many purposes and therefore inadequate for any of them. Presentation of complete detail may obscure relationships as well as add to the information that is given. Like all tools, accounting statements should be designed to fit the needs for which they are intended.' R. Ruggles, *An Introduction to National Income and National Income Analysis*, New York, 1949, p. 40.

follows. In principle, the sector division can be made institutional and the account division functional or vice versa. There have often been attempts to make both the sector division and the account division within the sectors functional by attributing certain functions to the institutionally fixed entities:[1] the firms become just producing units, households and government authorities just consuming units. In my opinion, this is not a very desirable tendency, especially when the government activity with all its different functions plays an important part in the national economy.

2. *Transactions*

The concept of transactions and the way in which transactions are classified will be more or less in accordance with the treatment in Richard Stone's works, and will be particularly close to Norwegian practice.[2]

An economic transaction can be characterized in many different ways. The following three are important for the subsequent treatment. Transactions may be:

1. Real or financial;
2. Actual or imputed;
3. Unilateral or bilateral.

1. When a service is performed or a good changes hands, this is regarded as a real transaction. When cash or financial instruments of some sort change hands, this may be regarded as a financial transaction. *Example:* The delivery of shoes from a seller to a buyer is a real transaction. The payment for the shoes is a financial transaction.

2. An economic transaction between two entities which is in fact accomplished may be classified as an actual transaction. An imputed transaction, on the other hand, is a hypothetical, but not actual transaction between two economic entities, or a transaction between two hypothetical parts of the same entity. *Example:* A sale from a farmer to a wholesaler is an actual transaction. A registered 'sale' from the farmer-producer to the farmer-consumer is an imputed transaction.

[1] See, for example, R. Stone, *Definition and Measurement of the National Income and Related Totals.* Studies and Reports on Statistical Methods, No. 7, United Nations, Geneva, 1947, and O. Aukrust, On the Theory of Social Accounting, *The Review of Economic Studies*, Vol. XVI (3), No. 41.

[2] See preceeding note.

3. Transactions often occur as exchanges. For instance, a good may be exchanged for another good or for money. A transaction of this sort which has a direct equivalent in the other direction is called a bilateral transaction, whereas a transaction which has no direct equivalent in the other direction is unilateral.

Looking back on the development of national accounting, the bilateralness of many transactions seems to have been of great importance for the design of national accounts, and perhaps even more important for the design of national income statistics. Real transactions have been valued with the aid of corresponding financial transactions. Thus it is always assumed that when an exchange occurs, the price governing the exchange is an accurate measure of the value of the product, except for the total aggregates qualified as 'at factor cost' or 'at market price'.[1]

As an aid to treating the problems, we shall use a system of national accounts, which (as in Stone's system) is restricted to entries of financial transactions.[2] Valuation according to the market price is supposed to be used for sectors[3] other than the government sector proper. The problem of whether the various items are to be entered as 'accruable' or 'cash' is not directly treated in the system, which may thus apply to either of these two aspects.

The sectors are regarded as being institutionally determined and each sector comprises four accounts which are functionally determined. These four accounts are: production, income redis-

[1] For the above reason it has been largely immaterial (a) whether a system of national accounts is used which only registers financial transactions ('flows of payments'), or (b) whether 'fourfold' book-keeping is employed, in accordance with Norwegian tradition. (See Aukrust, *op. cit.* The bilateral transaction is entered twice in the accounts in each of its aspects – real and financial. In other words the double-entry book-keeping is applied on each sector, and not only on the whole nation.) In the former case, the financial transactions can be used as representatives of the real, since there is equivalence of value. In the latter case, there is also supposed to be equivalence between real and financial transactions where are therefore entered in the accounts as having the same value. This has somewhat limited the utility of fourfold book-keeping in the national accounts. So far as I know, it has not yet been used either for any other valuation of real transactions than the valuation with the help of financial transactions, or in order to introduce the difference between 'accruable' entries and 'cash' entries.

[2] The entries are actual and, possibly, imputed financial transactions. The possible imputed transactions in this case usually have the justification for their existence in corresponding real transactions.

[3] Thus the problem of valuation for these sectors is not dealt with in this paper. Beside the government sector there are supposed to be at least two sectors: enterprises and households.

tribution, consumption and saving-investment. The economic process within each sector is reflected in this design of accounts. We begin with production, and the incomes which are generated are redistributed to the various sectors. The disposable income occurring in each sector is used for consumption and savings, and savings and borrowing are finally used for investments in different sorts of assets.

III. DEFINITION OF GOVERNMENT ACTIVITY

There are two institutional factors which are primary reasons for a special treatment of government activity.[1] In the first place the motives of government activity are in general different from those of private activity or, at any rate, are differently shaded. Government activity is motivated more by general economic and social policy than is the activity of private enterprise, where the profit motive has a more dominant place.

Secondly, government activity may be financed in a different way from that of private enterprise. The central government has the power to obtain income by taxation in order to meet government expenditure, without selling anything in the open market. This fact is important because a valuation norm of the bilateral type disappears for valuing real transactions in the national accounts. It is actually the methods of valuation of real transactions connected with the government sector which make the treatment of government activity in the national accounts an important problem. The problem of valuation will consequently constitute a large part of this paper.

Like so many other concepts used in practical statistics, the concept of government economic activity is to some extent imprecise. We shall not dwell, however, upon the definition of total government activity. That definition is principally connected with the first of the above reasons (the motives of the activity). Let us assume that we have in some way defined this total activity as, for instance, activity in which government entities of all sorts have direct power over planning and management of the activity.

However, the whole of this activity is not usually entered in

[1] Cf. G. C. Means, L. Currie and R. R. Nathan, Problems in Estimating National Income Arising from Production by Government, *Studies in Income and Wealth*, Vol. II, *op. cit.*, pp. 269.

the same sector in the actual national accounts. Some are classified as business activity and are specially dealt with in their own sector or lumped together with private activity in an enterprise sector. There is thus a boundary to be drawn between government activity which can be entered in the enterprise sector (in the 'market economy') and that which has to be specially dealt with and may be called general government activity. This demarcation depends partly on whether the activity is considered to be financed by tax revenue, or from the sale of goods or services.

In practice the boundary between the two types of government activity may be drawn with the help of several criteria, which in many cases cannot be used simultaneously. Some of the criteria are given below, a few being important, others less important.

(*a*) The first and main criterion is the profitability of an activity. According to this, government activity for which the income from sales normally covers the cost of production should be treated as business activity with market price valuation of production results. This is a general criterion usually applied in one form or another. Because of the possibility of considering unprofitable activity as 'subsidized' business activity, this criterion is not clear and sufficient.[1] There are other criteria which may be coupled with the given valuation norm behind this first criterion.

(*b*) In order that an activity shall be included in the market economy, a second criterion may 'stipulate' that the incomes must be relevant to the spending policy. The activity in question is to be an independently calculated activity, and must try to balance its income and spending. But if it is a different authority, such as parliament, which decides what is to be spent and determines incomes by means of fixed fees and the like, even an activity which is profitable may be included with some justification in general government activity.

(*c*) A government activity may have a direct equivalent within the private enterprise sector, that is, both may produce the same

[1] The losses on a government operation in the enterprise sector may be considered as equivalent to subsidies, so that market-pricing may be retained as a hypothesis. The possibility of using the concept of subsidies in this way as a bridge between the general government economy and the enterprise sector of the market economy makes it less easy to achieve clear distinctions. Problems dealing with indirect taxes and subsidies, and the interpretation of them, arise. However, these questions will not be taken up in this paper.

type of goods or services. This may be used to give a third criterion of whether a particular government activity should be entered in the enterprise sector, even if it does not normally run at a profit. As a typical example from Sweden, we can take the local government-operated tram and bus transport in Stockholm which has considerable yearly losses.

(*d*) A fourth criterion may be obtained as an answer to the question: Do the authorities consider the government activity as a business activity?

(*e*) Lastly, a fifth criterion is whether the government activity in question covers the use and administration of productive equipment in the form of real capital such as machines, plants and stocks. This would constitute a reason, from a book-keeping point of view, for including the activity in the enterprise sector. In other words, it should apply to activities for which it is natural to draw up a balance sheet.[1]

The choice of criterion depends on the purpose for which the national accounts are to be used. The second and fourth criteria are more suitable for analysis of changes, the third and fifth for analysis of results; as will appear below.

When talking of 'government activity' in what follows we mean, unless otherwise stated, general government activity.

IV. THE ANALYSIS OF RESULTS

1. *Some general remarks*

We will now concentrate on two purposes for which national accounts can be used. These are their use in the analysis of results and in the analysis of changes. The analysis of results is intended to answer the questions of 'how much' or 'what', and the analysis of changes the question of 'why'. The analysis of results is considered in this section, the analysis of changes in Section IV. In these two sections we deal with comparatively general economic transactions, such as 'direct transfers of income', etc. Some special transactions which are in practice dealt with in national book-keeping are considered in Section V.

The analysis of results is here taken to mean the analysis of the economic results (production, investment, consumption, distribution of productive resources, etc.) achieved in a particu-

[1] Cf. J. R. Hicks, *The Problem of Budgetary Reform*, Oxford, 1948.

lar country in a particular period.[1] Principally it refers to real transactions. It is usually carried out with the help of national aggregates, which are calculated at fixed prices. The main transaction sums which are used in the analysis of results are, of course, the national product and the national income.

National accounts might be said to have grown out of national income statistics. Thus, historically, the analysis of results is their most important purpose. As I see it, the design of national accounts has been too greatly influenced by the point of view that the organization of the accounts in order to be able to obtain national aggregates should be done in as neat a way as possible. This may result in balanced (net) transactions of less usefulness as a source of information than gross transactions which might otherwise be included in the accounts.

The analysis of results and its development hitherto may be looked at against a background of 'classical' economic theory. The 'price' is something absolutely essential for the use of this type of analysis; it is the prices which serve to evaluate the real transactions. When results are judged from the viewpoint of welfare or productivity, some sort of foundation in the preference maps of the individual and production substitution curves is desirable.

The problem of whether or not there is any sense in analysis of results – in its old form, at any rate – has been indirectly treated in the important discussion about the valuation of the national income which started with J. R. Hick's article[2] and of of which I. M. D. Little's book[3] is one of the latest developments. This discussion provides reasons for the utmost caution in the practical use of the usual aggregates of the national income statistics. Without doubt, there is sufficient justification for much scepticism about the possibilities of using national income statistics and national accounts as instruments for the analysis of economic results achieved by a country.

However, if we consider the large number of empirical investigations based on national income statistics, it is obvious that the use of national accounts for the analysis of results is, in spite of everything, still an important purpose. It is also possible

[1] Two important aspects of analysis of results are analysis of economic welfare and of productivity.

[2] J. R. Hicks, The Valuation of the Social Income, *Economica*, New Series, Vol. VII, 1940, No. 26, p. 105.

[3] I. M. D. Little, *A Critique of Welfare Economies*, 1950.

that, with the help of operational definitions, we may continue to use the old concepts even from a theoretical point of view. This may justify the use of national aggregates as aids for the analysis of results, even if it is not possible to reconcile their use with the classical theoretical models.

The details of the more theoretical discussion of the analysis of results may be disregarded here, however. We will instead concentrate on the problem of measuring (valuing) the real transactions connected with the government's activity.

Thus we take it for granted that the analysis of results is something which must be considered in any general discussion of the design of national accounts. People want to follow the course of real transactions through the production process. They want to make comparisons between different real transactions and between different periods and different geographical regions.[1]

2. *Government authorities as pure consumers*

The market price has usually been accepted as the general valuation norm; that is to say, the bilateral nature of transactions has been accepted, except when it comes to the concept of 'factor cost' in the national income statistics. So the attempts to fit in government activity may be said to have been a hunt for bilateralness, that is, a hunt for financial transactions which might be used for the valuation of a particular real transaction.[2] We will now consider the most important of these attempts.

A quite simple solution of the problem of valuation in the government sector has been to regard the government authorities only as consumers.[3] This approach has been used theoretically in the previously mentioned work by Stone, for instance, and in a way seems to be the assumption behind the treatment of government activity in the official calculations of the United States and some other countries.

Such an approach implies that the production account dis-

[1] Such comparisons can be found, e.g., in *Economic Survey for 1949* (ECE, Geneva), where the analysis of results has been carried to great lengths on a statistical foundation which is sometimes weak.

[2] In passing, it should be mentioned that the same problem occurs when an attempt is made to fit productive activity which is completely confined to the household sector – without any connection with the market – into the national income statistics or the national accounts.

[3] If the problem is considered theoretically from the viewpoint of the analysis of results, it would of course be very difficult to put the government authorities into the same category of consumers as the household. The whole of the theoretical apparatus, with its preference curves and everything connected with them, can hardly be used in a uniform manner for the government authorities.

appears from the government sector in the national accounts. The income redistribution account shows the net incomes available for purchases of goods and services from other sectors.

This method implies that the productive process registered in the accounts is concluded by the last exchange of goods and services in a market where there is pricing. The employees of the government become production factors who can be looked upon as producing units (a sort of enterprises) at the same time. As a consequence of this, they must be entered either in the enterprise sector or the household sector, and in both cases the wages must be registered in the production account as the financial side of a sale of services. The first alternative would be somewhat difficult to accept from a general practical point of view. The second would require, for consistency, that other labour power, such as is used in industry, for example, must be supposed to generate income in the household sector (production account).

Actually, this way of regarding the government authorities as pure consumers leads to a special definition of the economic process, statistically recorded by the national accounts. It implies, namely, basing the definition upon the occurrence of bilateral transactions.[1] If the principle that market prices are to be used for valuation of all real transactions is accepted, it seems necessary to treat the government authorities as consumers.[2]

Table 1 shows how the government sector might appear if the national accounts were made out with only consumption and not production within this sector. In this case, all real transactions would be entered in the consumption account only (through their financial equivalents). Consumption could be divided into 'durable' and 'non-durable' consumption goods, as in the household sector.

However, it is not always desirable to regard the government authorities as pure consumers. A great deal of the economic process, besides pure consumption, seems to go on in the government sector.

[1] Cf. A. C. Pigou. The national dividend 'is most conveniently taken to embrace only things purchased with money income, together with the services a man obtains from inhabiting a house owned by himself', *The Economics of Welfare*, London, 1924, p. viii.

[2] The definition of the household has the same consequence, since it means that work done by the housewife, for instance, is omitted from the calculations of national income.

TABLE 1

Government Sector
(Consumption Alternative)

PRODUCTION ACCOUNT

INCOME REDISTRIBUTION ACCOUNT

Direct transfers	Direct taxes
Subsidies	Other direct transfers
Disposable income	Indirect taxes

CONSUMPTION ACCOUNT

Purchases of durable goods	Disposable income
Purchases of non-durable goods and services	
Savings	

SAVINGS-INVESTMENTS ACCOUNT

Capital transfer for investment in governmental enterprises	Savings
	Borrowing
Lending	

3. *Government authorities partly as producers*

(*a*) *Cost valuation*

It is more usual – at least, in certain questions – to consider government activity as containing a productive activity too. All the volumes in the series *Studies in Income and Wealth*, where government activity has been dealt with in the calculation of the national income, bear witness to this,[1] as does the paper read by Simon Kuznets before the previous conference of the International Association for Research in Income and Wealth in Cambridge.[2] The common division of the national product into branches of industry ('value added') is further supporting evidence for this: government activity is also one branch of industry in that division.

[1] See, for instance, G. Colm, Public Revenue and Public Expenditure in National Income, Vol. I, 1937, p. 175; Means, Currie, Nathan, *op. cit.*, Vol. II; J. Lindeman, Vol. VI, 1944, p. 2; and G. Haberler and E. E. Hagen, Taxes, Government Expenditures, and National Income, Vol. VIII, 1946, p. 3.

[2] Government Product and National Income, *Income and Wealth Series I, op. cit.*

Instead of regarding the economic process as completed, by definition, when goods and services are no longer exchanged in the markets, we might base our attitude on the following definition of the productive unit, given by Richard Ruggles:

> The definitions of production and of the factors of production have laid the basis for defining a productive unit. Any individual, firm, or government agency that creates value by combining factors of production is considered to be a productive unit.[1]

Then the productive account of the government authorities becomes interesting too. Though what is to be entered in this account is more open to discussion.

If government activity is regarded partly as a productive activity, the hunt for the bilateral quality in transactions becomes historically more interesting.

Kuznets once considered the whole of government activity as an enterprise.[2] Government authorities provided certain services, and received income as payment for these services. In this approach, therefore, the government incomes are one side of a bilateral transaction, and the financial and real parts of the transaction are equivalent in value. This is really the only method in which business activity and government activity, looked at from the productive point of view, have received a uniform treatment. I do not intend to take it up for further discussion here. But there is the question of whether there is not more in the method than many people have been inclined to think, as far as concerns one special case. This is the case where the sum of the real transactions (the national product) is to be used as a measure of welfare. In this case, if anything, it is more the value of direct taxes than the factor cost value of the public consumption which the consumer could be imagined to consider in the evaluation on his preference map.[3] The relevance of taxes is, however, probably not enough to justify the use of the method.

However, the usual method of valuing the productive results of government activity has utilized the costs of production

[1] Ruggles, *op. cit.*, p. 11.

[2] See, for instance, *National Income and its Composition, 1919–1938*, New York, 1941.

[3] We must also remember that formerly theoretical financial works often were based on this type of hypothesis. See, for example, E. Lindahl, *Die Gerechtigkeit der Besteuerung*, Lund, 1919.

(factor cost) as an aid. A parallel with the prices in a market economy is sought by conceiving of the price (the value of the real transaction) as the sum of the cost elements. The idea behind this procedure seems to be that the values of the cost elements may usually be obtained from bilateral transactions in one market or the other (the labour market, etc.).

A cost valuation of government activity is made more difficult, of course, by the lack of some cost elements comparable with those in business activity, such as interest and profit. If the cost elements only of bilateral transactions are used, a 'productive' view of government activity gives the same result in certain national accounting fields as the view whereby the government authorities are regarded as consumers only.[1] For example, the national product has the same value. A value according to costs with the aid of bilateral transactions could take the accounting form indicated in Table 2.

TABLE 2

Government Sector
(Production Alternative I)

PRODUCTION ACCOUNT

Wages	Value of production transferred to consumption account
Purchases of goods and other services	

INCOME REDISTRIBUTION ACCOUNT

Direct transfers	Direct taxes
Subsidies	Other direct transfers
Disposable income	Indirect taxes

CONSUMPTION ACCOUNT

Governmental consumption:	Disposable income
(a) Durables	
(b) Non-durables	
Savings	

SAVINGS-INVESTMENTS ACCOUNTS

Capital transfer for investment in governmental enterprises	Savings
Lending	Borrowing

[1] Those who recommend cost valuation for government production usually have 'localized' consumption of this production in the government sector, too.

It is apparent from Tables 1 and 2 that the difference between the consumption and production approaches is rather small, at least so far as the treatment has progressed.[1] But valuation according to factor cost can be taken further. If less weight is given to bilateralness and more to parallels with the cost elements of enterprises, it is possible to impute transactions. For example, it is possible to introduce an item for the wear and tear of capital, and the like, after the fashion of firms. We will return to this in Table 3.

(*b*) *Other valuation norms*

We can consider a third way of valuing the result of government activity, besides the consumption approach or the valuation according to costs. This approach uses a direct valuation of government services, to a certain extent with norms arbitrarily chosen. This valuation might be associated with some suitable norm. It occurs in the national accounts in the households sector, when the farmers' personal consumption of their own products is assessed at a corresponding market price, or when the yield from a person's own home is assessed at the same amount as the rent paid for an equivalent rented place. In these examples from the household sector an attempt has been made to reflect the real transaction in a financial one which is taken from a parallel in the market economy. Such a parallel is, however, very difficult to obtain for a great deal of government activity. It is possible that such a parallel might be found for hospitals and some sorts of schools.

But it is possible to dissociate this valuation entirely from the market economy, and to imagine a valuation on a political basis, or one proved suitable for some practical purpose. Political valuation of a real transaction occurs, for instance, in Sweden in the so-called agricultural calculation. This is a survey of the incomes and expenditures within agriculture, and is used in fixing the prices of agricultural products. The political valuation is mainly connected with the imputation of a wage for the farmers.[2] This wage is of importance in fixing agricultural prices on the basis of a certain parity between costs and incomes.

Such an independent valuation according to prices fixed in some way or other, if applied to national accounts, would lead

[1] The difference is mainly in the generation of incomes. In Table 2 there is an entry for the generation of incomes (wages) which does not appear in Table 1.

[2] Certainly such a political valuation may be based on several different criteria, e.g. parallelism between wages for farmers and wages for agriculture workers.

to a production account like that of enterprises with a profit or loss balance to be transferred to the income redistribution account. If market prices are not stipulated as the only approved prices for the analysis of results, and prices determined in some other way are accepted also for the enterprise sector, the difficulties in assessing the value of government services disappear as a *special* problem. In accounts based on 'shadow' prices and intended for use in the analysis of results, the enterprise sector and the government sector are on equal footing.

4. *The general character of accounts*

Let us first try to summarize. If an attempt is made to put the analysis of results on a theoretical basis of preference maps for welfare measurements or on substitution curves[1] for production factors for productivity measurements, it is difficult to fit government activity into the scheme. There is no pricing for government services. One possibility is to regard the government activity as merely concerned with consumption. But there are many weaknesses in this procedure.

If this rather fragile basis for the analysis of results is rejected, there remain two alternatives. One is to abandon the analysis of results as founded on the national accounts, the other to seek new cases for valuation. It seems somewhat unsatisfactory to base this valuation only on a 'belief' that some sort of market prices or cost prices are applicable as soon as they are determined from market parallels.

If it is considered desirable to use the national accounts for the analysis of results, it seems appropriate to consider government activity also as productive, since so much happens to the economic process in the government sector. This activity is not altogether the same as in the case of a household, where the work of the housewife is usually disregarded. To a great extent the government activity is carried on for the benefit of other sectors. That has created the problem of 'intermediate consumption', to which we shall return later.[2]

[1] See J. R. Hicks, The Valuation of the Social Income, *op. cit.*

[2] The problem of whether the national product is to include activity facilitating the production of other goods or not is not considered here. It has been frequently discussed in all sorts of connections, for example, at the previous conference of the International Association for Research in Income and Wealth. It seems to be no objection against this calculation if the same sort of calculation is used for insurance and banking. In all cases we are entering the field of arbitrary imputations.

Whatever valuation is chosen, some general features regarding the handling of accounts in the government sector seem to be possible. It seems appropriate to build up the value by cost elements. It is part of the nature of the matter that a valuation for the analysis of results ought to have a reasonable cost counterpart. In drawing up such national accounts there is no need to avoid entering imputed transactions, as long as these can be valued in a way which is reasonable from the viewpoint of practical use.

The government sector of the accounts might usually appear as indicated in Table 3 when it is to be used for the analysis of results.[1] The items entered there might be used to various extents and at various valuations. In the form in which it is presented in Table 3, the sector contains first of all a production account. The value of government services is entered here on one side, and on the other side various cost elements. These may include the yield of real capital, the cost of repairs and maintenance, and the depreciation of real capital used for the production of services.

The income redistribution account contains, as always, only unilateral transactions. All unilateral transactions such as taxes, interest and the like are entered here. This account records all the transactions associated with the third essential function of the government authorities in the social economy, namely, that of income redistribution; the other two being its functions as producer and consumer.

Three different kinds of government consumption have been included in Table 3: one kind furthering business activity ('intermediate'), another individual consumption (household activity), and a third collective consumption. The first two are government consumption which implies services rendered to certain definite entities, while collective consumption includes the provision of such services as military forces. Alternatively, the latter might be divided up according to Kuznets' rules.[2]

This general approach (Table 3) implies that 'consumption' of the services produced by the government is localized to the government sector. In principle, there is nothing to prevent the

[1] These are the basic accounts and items. Certainly some accounts may be consolidated in the national accounts with other sectors if it is reasonable for some purpose.

[2] Simon Kuznets, Government Product and National Income, *Income and Wealth Series I, op. cit.*

transfer of these services to other sectors by means of suitably imputed transactions.[1]

TABLE 3

Government Sector
(Production Alternative II)

PRODUCTION ACCOUNT

Wages	Value of investment production
Yield of real capital	Value of consumption production
Purchases of goods and other services	
Cost of repairs and maintenance	
Depreciation	
Surplus	

INCOME REDISTRIBUTION ACCOUNT

Direct transfers	Transfer of surplus from production account
Subsidies	Yield of real capital
Disposable income	Direct taxes
	Other direct transfers
	Indirect taxes

CONSUMPTION ACCOUNT

Governmental consumption:	Disposable income
(a) Intermediate	
(b) Final individual	
(c) Final collective	
Savings	

SAVINGS-INVESTMENTS ACCOUNT

Capital transfer for investment in governmental enterprises	Savings
	Depreciation
Gross investment	Cost of repairs and maintenance
Lending	Borrowing

[1] There have been at least two practical attempts to carry the productive process beyond the government sector. One is the earlier U.S. method of allowing business taxes, and the like, to stand for payments for government service. This would mean that these taxes would be entered in the production account of the government sector. (This method persists in many countries in the treatment of fees, see Section F) The second method is implicit in the calculations of the German national income between the wars, with its 'fehlende Steuern'. The national income in Germany was calculated from the income side. Business incomes were entered after their tax payments had been deducted. So far it was in agreement with the old U.S. practice. But then there was an independent calculation of the value of those services which actually benefited household and enterprises respectively. If the enterprises received services to a lower value (arbitrarily and separately calculated) than the taxes they paid, an amount called 'fehlende Steuern' was added. The amount of taxes paid by enterprises and already deducted could be interpreted as payments for private household consumption (see *Bank Archiv*, 1942, p. 278 *et seq.*).

Such a treatment of government consumption and its localization to the 'final' consuming sectors could make use of the same method as Stone used for banks and insurance companies. However, it seems that there are some advantages to be gained by treating the accounts of bank and insurance activity by the same method as the government activity (Table 3), instead of vice versa. It would involve less strange imputed items. It would result in items for bank consumption and insurance consumption in the national product breakdown.[1]

5. *Some implications for the calculation of the national product*

Finally some comment may be offered regarding the aggregates resulting from the use of various types of national accounts as presented above. Certainly, the manner in which the government sector is constructed is important, for instance in the calculation of the national product.[2] It may create difficulties in comparisons between different countries.

In the first place, the location of the boundary line between government activity in the enterprise sector and government activity proper leads to differences in the size of the national product, when this is measured at market price. The relation between government consumption and subsidies is changed when there is a change in the proportion of government activity, not entirely profitable, included in the enterprise sector. The more such activity is recorded in the business sector, the greater the amount of subsidies, and the less the amount of government consumption and thus of national product at market price.

Secondly, the size of the national product is affected by the valuation of government activity. In a valuation from the cost side, for instance, the number of imputed items involved in the valuation is important. The value of government consumption can be obtained by adding the yield on administrative buildings (rent) to the cost elements obtained from realized transactions (wages, etc.). The size of the gross national product can be increased by recording government investments with those by enterprises. Then they are entered 'twice' in the gross national

[1] See *Ekonomisk Tidskrift, 1950*: 2.

[2] Of course, certain national accounts, if sufficiently differentiated, may be used for the presentation of a national product calculated from some other definition than the one which follows mechanically from the accounts. The possibility of varying the latter indicates the possibility of varying the concept of national product, however.

product, so to speak, in contrast to the case where real capital were regarded as durable consumption goods. (See Section V.)

The size of the national product can also be changed by valuing wages from military service in various ways. Nowadays, in some cases, food is included as an item of wages; in other cases, clothes too. It is also possible that there could be a further adjustment towards civilian 'use-values'.

V. THE ANALYSIS OF CHANGES

1. *Some general remarks*

We have now considered national accounts at some length from the point of view of using them in the analysis of results. That was done partly because the analysis of results constitutes the most important purpose in practice, and partly because the larger difficulties of incorporating government activity in the accounts arise in connection with that purpose.

The other purpose to be treated is the comprehensive concept 'analysis of changes'. The concept is used here because it is easy to handle and is a suitable pendant to analysis of results. I will assume, however, that the concept is used in a rather restricted sense, having approximately the meaning of business cycle analysis.

National accounts which are to serve this purpose must give statistical material for economic theories that are formulated to explain economic fluctuations from the short-term point of view. As there are many such economic theories, it is not possible to give any unique solution of how national accounts should be constructed in order that they may be used for analysis of changes.

I will not choose any particular economic theory by way of example. Instead, I will mention some typical ingredients of different theories of economic fluctuations. The relation between savings and investments is usually an important constituent. The correlation of various magnitudes in a causal chain may be another important one. Thus, a theory may assume a correlation in time so that expenditure on investments is directly determinable from the profits of the previous period (sequence analysis). A theory may also be linked with conditions of equilibrium

(without time-lags) that may be calculated with the aid of various propensities such as the propensity to save.

The hypothesis that the economic subject (an individual or a firm) acts in economic matters somewhat rationally, or at least consistently, is behind this search for relationships in many theories about short-time fluctuations. The reactions of the subject which in turn lead to certain definite economic actions are the basis for these theories. The theories thus imply the knowledge of the 'calculation models' or behaviour patterns of the various economic subjects. It is often supposed that these may be discovered and formulated from the subject's economic transactions. The national accounts may serve as a source of information about these economic transactions.

The activity of the government is often regarded as an 'external' factor in theories of the business cycle. It is not so easy to give the activities of the government a place in statistical 'calculation models' as it is to establish behaviour patterns for private activity. The interpretation of government activity cannot be incorporated in a behaviouristic scheme in any simple way. The private economy and the way it functions is therefore often used as the foundation, and its actions are considered to be interpretable by means of a theoretical model. The activities of the government are then often considered to influence the private economy in a measurable way.

The interdependence of different subjects, which is the main interest of the analysis of changes, should be illustrated by financial (realized) transactions in the first place. Imputed transactions may also be justified for the interpretation if the various subjects estimate them with approximately the value given statistically by the imputation. This is very difficult to determine. Therefore the imputation of transactions to be included in the national accounts for use in analysis of changes is rather restricted.

One imputed transaction is often included in the national accounts, namely, the depreciation of capital. The difference between the analysis of results and the analysis of changes appears quite clearly here. Certain depreciations calculated from a general economic point of view ought to be given in national accounts to be used for the analysis of results. From the viewpoint of the analysis of changes, it seems reasonable to use the amounts of depreciation changes given by the firms themselves.

These represent parameters in the plans and the economic action of the firms. They might differ very much from the depreciation items adequate for the analysis of results. Of course, it is probable that even the firms have many different ideas about the valuation of the imputed transaction of depreciation: one for the purpose of taxation, one for the shareholders, and one for internal use.

In national accounts constructed for use in analysis of changes it may also sometimes be a delicate operation to achieve an over-all balance. Perhaps it may even be doubted whether it is worthwhile to do so. Take as an example the writing off of bad debts. It is not likely that this transaction is dealt with in the same way by creditor and debtor. Nor is it certain that a particular transaction between two subjects is entered in similar types of account.

2. *Savings and investments*

Since the war, national accounts, or perhaps more exactly, national income statistics, have found an important analytical use in *ex ante* calculations of the inflationary pressure. This type of analysis of changes may try to estimate the excess demand for a future period. In Sweden, at any rate, this calculation is based upon a national account, 'the balance of resources'. In this, supply (gross national product and imports) and demand (gross investment, consumption and exports) are registered. Plans and forecasts concerning supply and demand are compared, assuming that prices remain unaltered, in order to estimate the inconsistency in plans *ex ante*.

Even though the reasoning about the excess demand is in terms of the total supply and total demand within the society, it could quite well be connected to the balance between savings and investment expenditures, considered in financial terms. This balance belongs to the typical ingredients in analysis of changes mentioned before.

To a certain extent, the private entities and government authorities play different rôles in the reality behind the statistical accounts of savings and investments. Hicks has expressed this from the expenditure side in the following way:

> For *at bottom* what the national income accounts have to show is the way in which an effective demand, sufficient (and no more than sufficient) to purchase the national output, is being secured. In the

> case of private demand, the distinction between consumption and investment expenditure is all-important, because they correspond to different sources, the one chiefly arising from the private accounts of individuals, the other from the business accounts of firms. But in the case of government demand the distinction is much less important, for both 'consumption' and 'investment' expenditure come from the same source. The line between them is inevitably an arbitrary line. Useful and intelligible accounts could be constructed with the line drawn in several different places.[1]

It is therefore the balancing of the budget and the excess or deficit in the total government budget, with its influence on the relation between savings and investments, which seems to be of particular significance for the analysis of changes. This balancing should appear in the national accounts if they are to serve the purpose we are considering.

3. *The general character of accounts*

When the national accounts are being used to analyse economic changes, attention is focused within the government sector on those accounts where the economic process can be registered with the help of the bilateral, realized transactions. The production account of the government sector is therefore not particularly useful. It would hardly serve the purpose to include any transactions in that account. But the income redistribution account is important. That will show how the government distributes income between various individuals, and this obviously affects their reactions and economic behaviour. It would be useful to see how the savings-investments balance in its private economic aspect is affected by the redistribution of incomes. However, it appears to be quite difficult to do this. There are no pure items which may be said to be directly related to savings at the next stage, etc. Perhaps it is possible to go a stage further. Contributions to unemployed and sick people will go principally to consumption at the next stage and so on.

The income redistribution account will contain roughly the same items for the analysis of changes as it did for the analysis of results – except the transfers from the production accounts (see Table 3). The two last accounts, on the other hand, will be somewhat different. As has already been shown, it is not decisively important in this case whether the government authorities

[1] J. R. Hicks, *The Problem of Budgetary Reform*, Oxford, 1948, p. 57.

make expenditure in purchasing consumption goods or investment goods, just as it is not so important in the household sector either.[1]

The balance of the consumption accounts is savings. The uses of these savings will appear in items which it is essential to distinguish. This can be done in the account for savings and investments. Some of the savings are used for investment in government enterprises. Even if these are managed like private firms so that income is expected to cover outlay, the investments are often determined by a central authority. In the savings-investments account, it is therefore important to distinguish amounts which are invested in government enterprises. What is left over may be called net government debt reduction, or increase of debt when it is a negative item, and constitutes the balance of the total government budget.

National accounts suitable for the analysis of changes might have much the same form as in Table 1. In other words, much the same type of national accounts is required as when the government authorities are regarded as pure consumers in an analysis of results.

So far as the most appropriate rendering of the accounts (in our case especially the government accounts) is concerned, different purposes for national accounts, thus, do not necessarily conflict in all details. The presentation is, of course, to a certain extent similar and furthermore certain compromises are possible. It seems to be the valuation of real transactions which is the main cause of differences.

We have considered two types of national accounts above. The problem becomes much more complicated, of course, if other purposes are introduced into the picture as, for instance, making figures available for 'international taxation' (contributions to the UNO and the like), for national budgeting, etc.

VI. SPECIAL TRANSACTIONS

The treatment of national accounts for the two purposes has hitherto been carried out only with the help of the ordinary total transactions. The distinctions have therefore probably not appeared as particularly important. However, we will now try

[1] That is not to say that it is entirely lacking in interest either from the viewpoint of the analysis of changes or from other viewpoints. Special entries in the consumption account for expenditure for 'durable' and for 'non-durable' goods and services are therefore desirable.

to illustrate the approach which has been used above by dealing with some traditionally troublesome items in the government sector.

1. *Subsidies*

It may be appropriate to distinguish two types of subsidies: for consumption, and for investment. The latter also serve to keep down the prices of consumption goods, but only indirectly and from the long-term point of view. Consumption subsidies are the most usual in practice.

The treatment of consumption subsidies in national accounts is often linked to the treatment of indirect taxation, and even more so in the case of national income statistics. 'Indirect taxes minus subsidies' has become a familiar item in national income statistics. This constitutes the difference between the 'market price' and 'factor cost' concepts in the realm of national aggregates.

When it has been a question of dealing with the item indirect taxes minus subsidies in the calculation of the national product and income, many interpretations have been put forward. The argument has usually revolved around indirect taxes. Corresponding reasoning (but in the opposite direction) seems to have been often tacitly applied to subsidies as well. Certainly subsidies and indirect taxes have common properties. In their effect on the level of prices they are clearly opposites. That is, however, not to say that an attempt to interpret the place of indirect taxes in national income statistics will always conversely apply to subsidies.

A subsidizing of consumption implies broadly that the government authorities pay a part of the production cost – usually via the enterprise sector – so that the consumption expenditure of the household sector is kept down. There can be different motives for subsidizing consumption. It may be considered desirable to give relief to the consumer or to the producer, for instance in agriculture. In both cases, subsidies affect the prices of certain goods.[1]

[1] The so-called 'intermediate' government consumption is also a sort of subsidizing, but it is applied by having the government perform productive activity which the firms do not then need to carry out. There are, however, many points of reference between intermediate government consumption and subsidies, and it is worth noting that it has not, as far as I know, been proposed to regard subsidies as a government consumption, although this would fit in with the usual treatment of fees.

The analysis of results, as mentioned before, aims at comparing various aggregates of real transactions which must first be valued. The real transactions – the selling of goods, for instance – are valued at a certain price. It is possible to use the market price or the factor cost, the latter being regarded in this case as a market price minus indirect tax plus subsidy. So far as the analysis of results is concerned, some consequences arising from the use of either of these valuations are worth mentioning.

If a real transaction to be entered in a production account of the enterprise sector is valued at market price, the indirect taxes should come into the enterprise's income redistribution account. The indirect tax transaction is not part of a bilateral transaction.[1] Neither is a subsidy an equivalent of a real transaction. The sale is already valued at market price, and the subsidy should therefore be included in the enterprise's income redistribution account.

On the other hand, if the various real transactions are valued at factor cost, certain technical difficulties occur in balancing the accounts. Such valuation would be best suited by a system with 'fourfold' book-keeping. In this case, the indirect taxes could be appropriately transferred from the household sector to the government sector as a redistribution of income, perhaps most suitably via the income redistribution account of the enterprise sector.[2] The treatment of the indirect tax and the subsidy in this case is a problem which would require a closer inspection of the 'fourfold' book-keeping. This would take us too far.

In the government sector, subsidies present no major difficulties of book-keeping. Subsidies, like indirect taxes, are entered in the income redistribution account. There are only two theoretically conceivable ways of registering subsidies and indirect taxes in other accounts. Indirect taxes might be entered in the production account if they were regarded as payment for government services. Subsidies might be entered in the consumption account if they were incorporated in government consumption. However, it seems that neither of these methods is to be recommended – certainly not the first.

[1] The payment of these taxes may, of course, be said to be covered by the balance of the production account.

[2] In Aukrust's terminology: via the account for current financial transactions. See O. Aukrust, *Review of Economic Studies*, *op. cit.*

The treatment of subsidies in the analysis of changes is somewhat different. The real transactions behind the financial transactions do not need to be given such close scrutiny. If the subsidy is related to the sales, the firms would presumably enter the subsidy in their production account. Assuming a consistent behaviour pattern behind the economic decisions, the subsidy ought to be entered in the same account of the national accounts. If the subsidy is applied in some other way, for example as some form of more indirect supplement to incomes, it might be included in the income redistribution account.

So far as the analysis of changes is concerned, subsidies ought to be entered in the government income redistribution account. Therefore the treatment of this item may not be the same in both sectors. From the viewpoint of one sector, enterprises, it may be a transaction to be included in the production account, while from the viewpoint of the other, government, it may be an item for the income redistribution account. This is a procedure of national accounting often used at the present time. If such accounts are to be consolidated to get a national income or national product, what is really obtained is the current national product at current market price, plus subsidies. The latter item is avoided in practice because the subsidies are drawn from both sides – implicitly at any rate – and the item 'indirect taxes minus subsidies' is obtained on the debit side of the consolidated production account.[1]

Let us now consider capital subsidies. When the government authorities subsidize a certain investment in the enterprise sector, a 'period problem' is introduced the economic consequences of which are difficult to estimate. Suppose an entrepreneur is going to install a machine which costs 20,000 crowns. Suppose also that prices during the whole of the period of depreciation remain unchanged, as does the utilization of capacity, that wear and tear is evenly distributed over the whole period, and that the entrepreneur is able to extend the depreciation of the machine over 40 years at 500 crowns a year. These 500 crowns are thus a measure of the real wear and tear valued at market price. This depreciation is a cost to be covered by the price of the consumption good which is produced with the help of the machine.

[1] However, for use in analysis of changes it is not necessary to get the concepts suitable for the analysis of results through consolidating.

Let us now suppose that the government subsidizes the capital good with 2,000 crowns. This has two effects. First, the entrepreneur gets the machine for 18,000 crowns instead of 20,000. It is problematical how the price should be recorded in the national accounts. If the subsidy goes to the producer of the machine, the price will probably be recorded as 18,000. If it goes to the purchaser of the machine, the price recorded will probably be 20,000 crowns – at least, if the seller's statistical material is used. However, let us assume that the subsidy goes to the producer of the machine. Second, it is necessary to depreciate the machine annually at the rate of 450 crowns only instead of 500. There is thus 50 crowns less of depreciation to be covered by the price of the consumption good.

So far as the national accounts are concerned, this means that the results of a capital subsidy must be considered in connection not only with the cost of producing and investing capital goods but also with the price of the consumption goods. Of course it might be possible to calculate such a subsidy item formally and to divide it up over the periods of some supposed lifetime. So far as the national product at factor cost is concerned, this imputed consumption subsidy would balance a depreciation subsidy. The net product thus remains unchanged.

The arbitrariness is thus considerable and the accounting rather complicated. The latter should be accomplished via transfers between the income redistribution and the savings-investments accounts in the enterprise sector.

It is also possible to regard capital subsidies as the mirror image of the expenditure on consumption capital, and to introduce it as a consumption subsidy in the year in which the construction of capital takes place. That part of the capital would then be written off at once as a subsidy.[1]

In our national accounts, capital subsidies in the government sector could be entered either in the income redistribution account or the savings-investments account.[2] If it is desirable from the point of view of the analysis of results to consider it as a single subsidy for future consumption, it might be appropriate to enter it in the income redistribution account, but otherwise in the capital account.

[1] In Sweden, capital subsidies, only small items, have been included among the other subsidies in the national accounts.

[2] Indirect taxation on investments provides a similar problem.

2. *Fees*

Fees may in many respects be regarded as the opposite pole to subsidies: subsidies may be considered as government payments in connection with certain goods and services produced in the enterprise sector and consumed in the private sector; fees may be regarded as a private payment in connection with certain services produced – and from a book-keeping point of view consumed – by the government authorities.

The fee is paid to the government authorities in return for a service, but it does not cover the costs for the service in question. In other words, the household or the firm pays part of the government expenditure on consumption. Of course, the reasoning could be reversed and the remainder of the costs not covered by the fees might be described as a subsidy from the government. If this latter reasoning is used, the activity ought by definition to be included in the enterprise sector of our national accounts.

Fees may, from the national accounting point of view, be considered in at least one of the following four ways:

(1) The fee may be entered as an expenditure on goods and services with the corresponding sales entered as an item in the government production account, or balanced against government purchases. The rest of the government expenditure on these services would then be treated as government consumption.

(2) The fee may be regarded as an indirect tax on government (not directly collective) consumption and it then raises the value of the government consumption by the amount of the fee.

(3) The fee may be regarded as a direct redistribution of income, in exactly the same way as direct taxation. This is especially appropriate when the fee is accompanied by an obligation on the consumer; for example, such school attendance that is not entirely free of charge.

(4) Fees may be considered as some sort of subsidy from the private sector to the government, and be balanced against subsidies in the other direction.

If we consider the analysis of results, the first way is not so suitable since it suggests that the real service transaction occurs in two places, once as a consumption service in the household sector (or half-finished in the enterprise sector), and again as the

same thing in the government sector; and this cleavage is somewhat incomprehensible from a strictly real point of view.[1] This method seems to be entirely financial.

The second method does not seem to have any realistic basis, only a formal one.

The third, the one which has hitherto been used in Sweden, does not seem to be altogether satisfactory either. But the weakness in this method seems to be of the same type as in the case of direct taxes.[2]

If we were to pass on the services produced by the government to the household and enterprise sectors by a process of allocation similar to that used by Stone for banks and insurance companies, it might be possible to solve the problem of fees in the same imputed way as the problem of bank incomes, lumping fees together with imputed fees.

Thus it is not easy to deal with fees in national accounts drawn up with the analysis of results in mind. This is particularly true of the fees paid by firms.

For the analysis of changes it seems to be suitable to enter fees in the production account of enterprises and in the income redistribution account of the government authorities. For the enterprise fees are a cost of production. In the household sector fees are best regarded as expenditure on consumption.

It is the analysis of changes aspect which has in practice often influenced the treatment of fees in the preparation of national income statistics. Generally, fees have been balanced against government consumption in the calculation of the national product.[3]

[1] Using ordinary symbols it implies the possibility of dividing pq for the service in question into $p_1q_1+p_2q_2$. This is evidently impossible.

[2] This will appear from the following example. The government takes over a number of branches of production at the half-finished stage, and defrays their cost, for instance, one-third with fees and two-thirds with taxes on the enterprises. The private enterprises then get a bigger profit in their production account, since both fees and taxes are dealt with as redistribution of income. Obviously this reasoning is one aspect of the old 'intermediate services problem'. The problem will always have two conflicting sides. It is in some respects rather artificial to show a larger profit for the arms in this way (and a larger national product) when they actually pay for the service in question. There is not such a close connection between some taxes and some special expenditures, when you are looking at the statistics *ex post*.

[3] In passing it will not be out of place to mention once again the inconsistency with reference to the simultaneous treatment of subsidies. If a transaction associated with fees is split up in a rather peculiar way, so that it is entered in the accounts in two places, as fee for a good or service and as a remainder of government consumption, consistency would demand the equivalent procedure for subsidized activity. Subsidies would then become government consumption.

The treatment of subsidies and fees in national accounts designed for the analysis of results is a good illustration of the valuation problem which occurs in connection with government activity, where it is no longer possible to use market pricing. Especially when fees are considered in an accounting system to be used for analysis of results, the problem is in certain respects insoluble within the usual accounting and valuation framework. However, it is a consolation that in practice the amounts involved are probably rather small.

3. *Entering government capital in the accounts*

From a practical statistical point of view, the biggest differences from one country to another are likely to occur in the treatment of government capital, as far as the government sector in the national accounts is concerned. Variations here might lead to relatively important variations in the national product, especially in the gross national product.

We have already seen that it may be desirable in the case of the analysis of results to account for government capital by calculations comparable to those used in an ordinary firm – although government capital is not involved in production for sale. The capital in question usually consists of administrative and social buildings, including schools and hospitals, military constructions and heavy material, and roads.

If this capital were to be treated as it is in the enterprise sector, each year a *gross* yield would be calculated for the capital, and the amount of this would be entered in the government consumption. This yield would need to cover the costs of depreciation, and moreover there ought to be a net service value or rent generated by the capital.

The simplest way of accounting for government capital would be to regard the value of the depreciation as equal to the gross yield or the service of the capital and to depreciate each capital good entirely in the year of investment. This implies, for example, that the building of a road would be included in the national product as an investment, but written off as immediately depreciated, whereupon the depreciation is added to government consumption as a cost.[1]

This method may have two important consequences:

[1] If government investment and thus depreciation should fluctuate much from year to year, a more smooth depreciation series certainly ought to be calculated.

(*a*) The gross national product would be increased by the amount of the investment expenditure, compared with the case where such expenditure is directly considered as consumption[1] (durable consumers' goods).[2] Net national product, of course, remains unchanged either way.

(*b*) The balance on the government consumption account might be identical with the surplus on the current budget; this is the case in Sweden.

The treatment of capital in the government sector is a problem primarily when the national accounts are used to analyse results. To solve it, there must be some theory or generally accepted rule for valuation. As mentioned in a former section, for the analysis of changes not so much attention need be paid to this problem. Imputations are not useful in this case.

A special problem regarding the manner of accounting for capital may arise when there is a transfer of real capital from the government sector to the enterprise sector. It occurs in the government sector if the capital has previously been 'written off' as totally depreciated and has thus been statistically regarded as government consumption, in the form of total immediate depreciation. Logically in such a case the government consumption ought to be decreased by the value of the capital when it is put into the enterprise sector. The sale of real capital thus might be recorded under investment as a minus item by the seller and as a plus item by the buyer; and to offset the former depreciation it might appear as a deduction from the consumption of the seller, i.e. the government authorities.

4. *Military pay*

Wage payments to persons called up for military service are an item by themselves. The wages can hardly be called expendi-

[1] In the proposals for a 'simplified system' made by the National Accounts Research Unit, O.E.E.C., 1951, military investment expenditure is directly included in government consumption. There is much to be said for such a procedure: military investment is essentially different from investment in production equipment for civilian use. But in other respects usefulness is lost by doing this. Of course it depends on the purpose for which the figures of the accounts are to be used. In Sweden the figures are used among other things as a statistical aid in the regulation of investment (an administrative purpose). This regulation is intended to economize the production resources available for investment, which are scarce in proportion to the demands upon them. Every use of these factors of production must therefore be classified as investments, even use for military constructions and heavy material.

[2] If a net value of the yield on the capital is added, then both the gross national product and the net national product become higher.

ture for production factors purchased in a free market. Although the military personnel receive limited remuneration, compulsory enlistments can hardly be valued by their pay. It is problematical whether these transactions can be said to be bilateral in any sense.

As for the use of national accounts in the analysis of changes, the valuation of military service presents no special problem. Government payments to military personnel are a financial transaction and may be entered in the consumption account, since they take place in connection with the utilization of certain production factors. They might also be put in the income redistribution account. This is perhaps the best way to treat the payments when analysis of changes is concerned. They will in such a case be considered as a unilateral transaction.

For the analysis of results, military pay is extremely troublesome. It has no particular meaning from the theoretical point of view. It does not represent a price in the classical sense. It cannot be considered as a factor cost, and thus does not fit into a reasoning about substitution of production factors between different fields of use, for example, in working on the national budget. Nor has it any special meaning if the government authorities are regarded as pure consumers.

One way would be to regard military personnel in the same way as housewives in the household sector. For lack of accurate valuation, they are not included in either the production or consumption accounts. So far as I know, a parallel with housewives has not been used for solving the problem of military pay. One reason may be that we are in the military case concerned with production factors which are used in another sector than the one in which they originate.

The many possible ways in which remuneration of military personnel may be treated are evident from practical works. Sometimes only the financial remuneration is considered as a wage. Sometimes government expenditure on food for the personnel is added to the wage. And in other cases the expenditure on clothes too is regarded as part of the wage. We could go further. Expenditure on lodging accommodation may also be included. There are also variations in the treatment of financial remuneration of military personnel. Sometimes invalid pensions and family pensions, and the like, are included in 'wages'. In other cases they are not.

The usual treatment of military 'wages' in the national

accounts has important consequences for the use of the accounts in the analysis of results. It is possible to get large 'increases in productivity' in cases where the average military 'wage' is lower than the average civilian wage, when military personnel pass over to civil production, and vice versa.

Military payments are, like fees, an example of the valuation problem in connection with analysis of results. It can only be solved if some sort of 'shadow prices' are adopted for valuation of real transactions.

VII. SUMMARY AND CONCLUSIONS

1. I have tried to show the great amount of arbitrariness in the treatment of the government sector in national accounts. There is a corresponding arbitrariness in other sectors, for example, banks, insurance companies, private non-profit institutions, but it is more clearly apparent and has greater practical significance in the government sector. It may be possible to reduce the degree of arbitrariness by considering the purposes for which the national accounts are to be used.

2. The analysis of results, historically, has been the most important purpose for the construction of national accounts beginning from national income statistics. The analysis of results has almost always had a background of a market economy, and consequently the transactions have been considered bilateral. However, recent international discussion has shown the theoretical assumptions behind bilateral valuation to be deficient in many respects.

3. Government activity fits into present-day theories for the analysis of results less easily than do the majority of private activities. In evaluating the government sector there is little gain to be obtained from hunting for formal likenesses with the private sectors. But it is possible to think of a scheme for reporting the activities of the government sector on the basis of various valuations of a more general type such as are used in the enterprise sector. However, it must be given a theoretical or politically acceptable content.

4. The analysis of changes is interested in the interdependence of various entities within the social economy, and in calculation models or behaviour patterns that may explain the actions of

the private economic entities. This can be partly derived from the financial transactions in national accounts. For this purpose the government sector can be included in the accounts rather well. If the analysis of changes looks for its explanations outside this financial interdependence, the accounts lose some of their usefulness.

5. The main purpose of national accounts in their more usual form should be to describe in statistical terms the economic activity which is entirely within the markets, that is to say, to register financial transactions. For the analysis of results, other types of statistical registration ought to be found, like Leontief's 'input-output-system'.

6. It is important that statisticians who deal with national accounts give more attention than hitherto to the purpose of national accounts. This is certainly applicable to the international organizations which are trying to achieve very desirable standardization of the statistics in this field. If we do not have some criteria provided by the theoretical basis and the purpose of these accounts, they easily become a system in which technical finesse and formal qualities play a dominant rôle in design. This is particularly obvious in the government sector.

7. It is possible that certain standard alternative types of national accounts may be drawn up with reference to the purposes which are at present most important. If this is to be done, there must be agreement in each special case about the demarcation of the boundary between general government activity and government enterprise activity, and about the treatment of certain standard items.

SECOND CONFERENCE OF THE INTERNATIONAL ASSOCIATION FOR RESEARCH IN INCOME AND WEALTH

held at the Abbaye de Royaumont, near Paris
26th August – 1st September 1951

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Paul Jostock: The Growth of National Income and National Wealth in Germany. Translated by Ernest Doblin.

*Simon Kuznets: Long-term Changes in the National Product of the United States of America since 1870.

†Shigeto Tsuru: Long-term Changes in the National Product of Japan since 1950.

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3. *Treatment of Government Activity and of the Nationalized Sector of the Economy*

Sessions organized by Erik Lundberg

†Ingvar Ohlsson: Treatment of Government Economic Activity in the National Accounts.

4. *Income and Product in Under-developed Countries*

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†Milton Gilbert: Statistical Sources and Methods in National Accounts Estimates and the Problem of Reliability.

Richard Ruggles: European National Accounts Statistics.

* Published in *Income and Wealth Series II*, Bowes & Bowes, Cambridge, 1952.

† Published in *Income and Wealth Series III*, Bowes & Bowes, Cambridge, 1953.

†† Part of this paper is published as No. 6 of *Income and Wealth Series III*, Bowes & Bowes, Cambridge, 1953, and part in *Oxford Economic Papers*, Vol. 4, No. 1, February 1952.

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